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ABSTRACT

This study evaluated the procedures and results of the identification of children with Perceptual-Communicative Disorders (PCD) in Colorado. The process of identification includes referral, assessment, staffing and placement. The number of children identified as PCD by current procedures is large and growing. Variations in the prevalence of PCD among units and across years suggest the existence of local patterns in identification, and reflect the fact that PCD is an ambiguous diagnosis. Colorado's definition of PCD is conceptually similar to the federal definition of specific learning disabilities, characterized by a significant discrepancy between ability and achievement, attribution of the cause of the discrepancy to a processing disorder, and exclusion of other causes for poor achievement. During assessment, the typical child is given 6.6 tests plus several informal assessments by an average of 7.6 professionals. Of the 18 most frequently used tests, only five are adequate. Between 59 percent and 74 percent of pupils identified as PCD do not match the legal definitions. These identification procedures do satisfy state and federal requirements, but it costs almost as much to identify a child as PCD as it does to treat him or her for a year. (Author/BW)

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EVALUATION OF THE IDENTIFICATION OF PERCEPTUAL-COMMUNICATIVE DISORDERS IN COLORADO

FINAL REPORT

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EXECUTIVE SUMMARY

The research reported herein was designed to evaluate the procedures and results of the identification of children with Perceptual-Communicative Disorders (PCD) in Colorado. The process of identification is meant to include referral, assessment, staffing and placement. Representative samples of PCD pupil files were selected so that the characteristics of PCD children could be compared with the definitions of PCD or learning disabilities (LD) in federal and state laws and in the professional literature. The adequacy of assessments and the compliance with due process requirements were evaluated. Surveys of representative samples of professionals were designed to ascertain principals', PCD teachers' and clinicians' practices, beliefs and opinions about PCD identification. Documents such as laws, rules and regulations (both federal and state) were analyzed and their provisions compared to prevailing practices. District, state, and national rates of PCD or LD were analyzed for variability and trends. The professional literature on definition and assessment of learning disabilities was reviewed. The resulting data were presented in a draft report that was reviewed by special education directors and experts in this field. In the following few pages, the major findings are recapitulated and our analysis presented.

The number of children identified as PCD by current procedures is large and growing. The percentage of PCD in the total population of Colorado school age children is increasing steadily over the years, from 2.1% in 1973-74 to 4.2% in 1975-76 to 5.1% in 1979-80. These figures exceed the national average for this handicap, although several western states have rates of learning disabilities higher than that for Colorado.

The percentage of PCD in the total population of handicapped in Colorado is also increasing from 22.4% in 1973-74 to 36.7% in 1975-76 to 46.7% in 1979-80. PCD may be a less stigmatizing label than Educable Mentally Retarded or Emotionally Disturbed and thus may be gaining numbers at the expense of the other handicaps. There is substantial variability in the rates of PCD that are identified by the different special education units (school districts or BOCS). In 1979-80, rates varied from 2.11% to 8.56%. Variations in the prevalence of PCD among units and across years suggest the existence of local patterns of strictness and laxness in the identification of PCD. They reflect the fact that PCD is an ambiguous diagnosis and that determining whether a given child has it is problematic.

Colorado's definition of Perceptual-Communicative Disorders is conceptually similar to the federal definition of specific learning disabilities. The key elements which define PCD and specific learning disabilities are: a significant discrepancy between ability and actual achievement, attribution of the cause of the discrepancy to a processing disorder, and exclusion of (i.e., ruling out of PCD) other causes for poor school achievement, such as mental retardation, visual or auditory handicaps, emotional disorders, or lack of opportunity to learn. Although the legal definitions reflect state-of-the-art understanding of what a learning disability is, they are neither precise nor exact. Therefore, they permit considerable latitude in what criteria may be used to identify LD or PCD. Furthermore, professionals who participate in the identification of PCD in Colorado differ widely in the extent to which their individual views match the legal definition of PCD.

During assessment for possible PCD, the typical child is given 6.6 tests plus several informal assessments by an average of 7.6 professionals. Although some children are given excessive numbers of tests (3 or 4 IQ tests or more than 11 formal tests), one-quarter of the PCD pupils did not have sufficient testing to support a valid diagnosis. Of the 18 most frequently used tests in PCD assessment, only 5 are adequate. Most tests used do not have adequate reliability and validity and thus do not meet technical standards published by the profession. Clinical judgment is frequently cited as an alternative to tests in the assessment of PCD. As presently practiced, however, there are few signs that clinical judgment improves the validity of PCD identification. Clinical judgments about processing disorders were found to be consistent only a small proportion of the time and often clinicians interpreted single signs as being dysfunctions when they are just as frequently found among normal children. Low reliability and validity increase the likelihood that mistakes will be made in deciding whether an individual child is PCD. More often than not, the errors are in the direction of identifying as PCD children who are normal or have other kinds of problems.

Between 59% and 74% of pupils who have been identified as PCD by current procedures do not match the legal definitions or the definitions in the professional literature. Many fit better the characteristics of emotional disturbance, language interference, or slow learners. Many are simply behind their age-mates in achievement or "need extra help" according to the judgment of school personnel. Even though so few members of the population identified as PCD actually have reliable signs of that disorder, we judge that as many as 82% of the current PCD population do need help not now provided in the regular classroom. The types of help they need might more properly be defined as remedial tutoring, psychotherapy, family therapy, intensive English language training, or bilingual education, and not defined as special education for the handicapped. Some other individuals need emotional support, alternative school settings, or more flexible teachers.

The identification procedures, in all but a minority of cases, satisfy the state and federal requirements. Due process seems to be satisfied. The assessments are usually made by two or more clinicians. The staffing decisions are almost always made by teams of more than two people and more often by an average of 7 or 8 professionals. The majority of professionals surveyed are satisfied with the thoroughness and efficiency of current procedures. They agree, however, that parents are sometimes intimidated by the process.

It costs almost as much to identify a child as PCD as it does to treat him or her for a year. Most of the dollar costs are attributable to the time clinicians spend in assessment. The benefits of extensive testing are nebulous and arguable except for the benefit that due process requirements themselves are fulfilled. The excess of costs over benefits of PCD identification are attributable to redundant assessment with bad tests and to state and federal policies that require wholistic assessments, team decision-making, and elaborate, bureaucratic procedures to ensure due process.

There is much anecdotal evidence to support the conclusion that children are over-identified in the PCD category because clinicians feel there is no other recourse for providing them with the special help they need. Policy makers who seek to reduce the numbers of PCD pupils will have to address the issue of how to provide programs for the types of children identified in this study: those with non-English language interference, the more extreme slow learners, children far behind in school because of poverty and poor attendance, and emotionally disturbed children whose teachers may not know how to cope with them. At the same time, clinicians eager to meet the needs of children will have to address the issue of the extra costs and potential harm that results when normal children are called handicapped.

There is an obvious need for clarity in the definition and criteria for identifying PCD. The procedures cannot be reduced to simplistic statistical rules, although minimal criteria for the reliability and discriminant validity of both formal and informal assessments can be established. However, because the current requirements for assessment and participation of professionals already lead to excessive costs, any attempt to add requirements should be accompanied by a reexamination of the present Colorado regulations, especially those which are substantially beyond the federal requirements.

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1

INTRODUCTION

Learning disabilities is a relatively new category of handicap in the field of special education. The term, first used by Kirk in 1963, was a neutral descriptive label for children who had previously been called brain-injured, neurologically impaired, perceptually handicapped or said to suffer minimal brain dysfunction.

In 1968, the National Advisory Committee on Handicapped Children of the U.S. Office of Education developed a definition of specific learning disabilities. That definition was modified only slightly in the current regulations accompanying Public Law 94-142.

> "Specific learning disability" means a disorder in one or more of the basic psychological processes or in language, spoken or written, which manifest itself in imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or emotional disturbance, or of environmental, cultural, or economical disadvantage. (U.S.O.E. 1977, p. 65083)

The Colorado definition of perceptual and communicative disorders (PCD) closely parallels the federal definition of specific learning disabilities. Both the Colorado and the federal definitions are vague. They convey only a general understanding of what kinds of children were meant to be included in this category of handicap. These are not operational definitions, however; deciding whether a given child is LD or PCD is not concrete and precise. The absence of an adequate definition is commonly recognized.

Hammill (1974) called the NACHC definition ambiguous. Thurlow and Ysseldyke (1979) said that the criteria used in identifying children as learning disabled have been both "highly variant and nebulous" (p. 2). Divoky (1974) wrote, "The truth is that learning disabled are whomever the diagnosticians want them to be" (p. 21). One explanation given for the confusion is the tremendous diversity in the population to which the label is applied. It is also true that the state of research is such that there is not clear understanding of the concept of learning disabilities, hence it cannot be operationalized. In this sense the current federal and Colorado definitions are as good as any available.

Given the federal and state mandates (through PL 94-142 and The Handicapped Children's Educational Act) to identify children with PCD and provide programs to meet their special needs, special educators have identified and placed children with perceptual or communicative disorders despite the ambiguous definition.

Whether currently identified PCD children meet the theoretical definitions of learning disabilities or the legal definitions of learning disabilities or the legal definition of PCD is unknown. Very little has been done to determine the actual characteristics of children placed in LD programs. In 1980, Norman and Zigmond published intelligence and a achievement data for a large sample of learning disabled students in Child Service Demonstration Centers. They noted the limited research on the empirical characteristics of LD Children (citing one other study by Kirk and Elkins (1975) which also contained IQ and achievement data). Almost none of the research provides information on what characteristics qualified LD children for placement or on the validity of those diagnostic decisions. In Colorado, neither the assessment practices nor the validity of PCD placements is known.

Purpose

The purpose of this study was to describe and evaluate the procedures used to identify, assess and place PCD pupils in Colorado.

The following research questions guided the research:

1. What definitions and criteria guide the identification of PCD pupils?
2. How many children are identified as PCD? Are differences among districts and BOCS in the percents of pupils identified associated with differences in the characteristics of PCD children?
3. What tests are used in the assessment of PCD children? Are the tests reliable, valid and fair?
4. What is the role of clinical judgment in identifying children as PCD? How valid are these judgments?
5. What are the characteristics of children who are called PCD? Can a potentially diverse population of pupils be described in terms of more homogeneous, identifiable sub groups? How valid are the diagnoses of PCD?
6. How much does it cost to identify a PCD child?
7. Once identified, are PCD children provided with interventions that can be supported by current research evidence?

Organization of the Report

In Chapter 2, the methodology of the study is described. Chapter 3, Definitions, contains an analysis of the key components in the legal definitions of PCD and specific learning disabilities. It also includes findings from the survey of professionals regarding the definitions and criteria they use in identifying PCD. Chapter 4, Prevalence, is a brief summary of population data regarding the prevalence of PCD in Colorado school districts. Key variables developed to reflect the validity of PCD placements are correlated with district percents of PCD. Chapter 5 is a summary of assessment practices. The validity of tests and test interpretations is evaluated.

A model for clinical judgment and hypothesis testing is presented and used to examine the adequacy of clinical judgment as typically exercised. Chapter 6 is a summary of staffing procedures.

Chapters 7 and 8 contain the central findings from the study. In Chapter 7 important subgroups within the PCD population are identified. This is done independently by both quantitative and qualitative methods. These analyses answer the question, "How many PCD children truly have perceptual or communicative disorders?" Chapter 8, by Dr. Smith, consists of 10 prototypic case histories of PCD pupils.

Chapter 9 is an analysis of the costs incurred in the assessment and identification of PCD children. In Chapter 10, Findings and Related Issues, we summarize key findings and discuss the merits of PCD identification procedures in Colorado.

2

METHODOLOGY

Two separate, large-scale studies were undertaken to describe and evaluate the assessment and placement of PCD children in Colorado. The first was an analysis of the case files of individual pupils currently classifed as PCD. The second was a survey of professionals presently involved in the identification process. The methods of data collection and analysis for these studies are described in the two major sections of this chapter. Supplementing these two studies is information from the following sources: CDE data on the number of PCD pupils served and the programs provided to them; comparable nation-wide data from USOE publications; and professional literature on learning disabilities. The supplemental information has been integrated with the findings and discussion of this report.

Sampling of Special Education Units

Both the analysis of PCD case files and the surveys of professionals required that a statewide probability sample be selected. A two-stage sampling design was developed to satisfy both logistical constraints and the need for precise, representative estimates of the characteristics of both populations studied. Because so many details would have to be worked out in obtaining the cooperation of participating units, the first stage of the sampling design called for a representative sample of special education administrative units to be chosen. From the administrative units sampled in the first stage, probability samples of PCD case files and professionals were selected in the second stage.

Sampling Units. The 48 special education units were categorized by type (districts or Boards of Cooperative Services (BOCS)) and were divided into three size categories. Units were sampled at random from within each of the size and type categories. Complete details on the sampling frame and sampling fractions are given in Appendix A. The number of units to be selected from each stratum was chosen to keep the number of students in the sample roughly proportional to corresponding population sizes. Exact proportionality for both the pupil and professional studies was achieved by post hoc weighting, also explained in the technical appendix. A total of 22 out of the 48 administrative units was sampled. This number is just under half of the units; but because of the proportional sampling, it includes units with well more than half of the PCD pupils in the state.

All of the 22 randomly sampled units agreed to participate. The level of cooperation is probably due to the legislative authority for the study and the support for the importance of the study from CDE staff and special education leaders in the state.

The purpose and methods of the study were presented at the annual meeting of special education directors in August 1980. District Superintendents and Executive Directors of BOCS for the representative sample of units then received a letter stating the purpose of the research and briefly describing the methods and procedures. Reference was made to a more detailed letter being sent to the Director of Special Education in that unit. Unless the Superintendent or Executive Director had specific concerns, all subsequent arrangements would be made with the special education director. Letters describing the research were also sent to the superintendents of all the member school districts in the sampled BOCS explaining that we would be working with the Director of Special Education in their BOCS to obtain permission for the study and to work out logistical details. In a few instances directors asked that we also inform building principals of our study plans. Other directors exerpted parts of our letter in their own memoranda to principals. Copies of the text of any of these letters are available on request.

Directors with concerns about the study contacted the principal investigator. Issues especially included assurances of the confidentiality of data and minimizing the disruption of normal activities. When asked, the researchers met with groups of specialists in the participating units to discuss the purposes of the study. The timing of the data collection visits was arranged with the concurrence of the directors but was especially governed by the need to make all visits in a particular sector of the state during the same week. In three instances the schedule was altered substantially to accommodate districts with major reviews or accreditation visits planned with other agencies.

Directors of Special Education in the sampled units were interviewed (by phone in one case) by members of the research team, all of whom have had training in interview methods. A formal protocol was developed for the interviews with standard probes for following up on open-ended questions. Directors were informed that their responses would be treated as data and summarized as part of the study results. Interviews ranged from 50 to 90 minutes. Some directors preferred to respond in writing to some questions. Copies of the formal interview protocol and the full set of questions are available on request. Detailed questions addressed the following general issues: Definition of PCD and operational criteria, incidence of PCD--causes of over-and-under identification; funding formula for reimbursement from the state, assessment and staffing procedures, types of instructional interventions for PCD students.

As part of the interview, directors were asked whether additional guidelines were used in their units to amplify the state definition of perceptual and communicative disorders. When available, written documents were obtained and analyzed for essential defining elements following the conceptual framework developed in Chapter 3. In addition, all of the 1980 Comprehensive Plans for Special Education which had been submitted to the Colorado Department of Education by September 1, 1980, were reviewed for PCD identification criteria. However, because Comprehensive Plans had only been filed for 19 of the 48 units and these were not a randomly-selected representative sample, no attempt was made to generalize on the basis of this latter source of information. Elaborations of the state and federal definitions in individual units are discussed in the chapter on definitions.

Study of Pupil Case Files

Purpose

The analysis of case files was undertaken to answer the following questions: What are the characteristics of pupils served in PCD programs in Colorado? What reasons were given for referral of these children? What tests were used to determine that a handicap exists? Who was involved in assessment and decision-making? In addition to describing identification practices, the purpose of the study was to evaluate the validity of the procedures used for identification, assessment, and placement. Do actual assessment practices meet professional standards for the technical validity of tests and for confirmation of clinical judgments? Are the definitions and criteria implicit in the placements of real cases congruent with published guidelines? Overall, how valid are the determinations of perceptual and communicative disorders?

Case Sampling

To answer the questions stated above, it was necessary to examine the files, maintained in district or school offices, of children classified as PCD during the 1979-80 school year. A probability sample of all such files was chosen to assure that the case files actually studied were representative of the population of cases.

The population of PCD children was defined by the lists of handicapped children submitted by each administrative unit to the Colorado Department of Education in July of 1980 for the 1979-80 school year. According to the guidelines governing the submission of the state forms, a child is listed if he or she received special education for all or any part of the school year. Children are reported by their primary handicapping condition to prevent duplicate counts of chilren with two identified handicaps. The population for the study was all the children identified with PCD as their primary handicap which corresponds exactly to the 26,508 head-count of PCD pupils reported for 1979-80. The population lists were not identified by pupil name but were duplicate copies of lists with names kept by the units.

Thus it was possible to sample cases randomly by number and to locate the specific cases. For the few units that submitted only aggregate reports, sampling was done on-site from the corresponding individual lists.

The first stage of the sampling plan was described in the previous section, Sampling of Special Education Units. The second stage was a random sample of cases from the population lists for the participating units. The number of cases to be drawn from each unit was determined by stratum membership. A uniform number of cases to be sampled from all units in a given size stratum was determined on the basis of the proportion the stratum constituted of the total population and the anticipated variability within strata based on a few known indicators. The differential distribution of PCD cases by units within strata was then reflected by the exact weighting schema described in Appendix A. The best way to understand the weighting computations is to realize that each pupil sampled stands as a proxy for parallel cases not sampled. The weights used in the analysis reflect an unbiased estimate of how many other PCD pupils in that district and in that stratum the individual case represents.

The total sample of 1000 pupil files (3.8% of the population) was selected. By using the sampling design described, it is possible to specify the probability each member of the population has of being selected in the sample. It is also possible to specify the amount of error encountered in inferring the characteristics of the population based on the characteristics observed in the sample. The sampling error is relatively small and is used to report confidence intervals on all key findings in the report. The potential errors from other sources associated with sampling, such as "non-response" and adequacy of the sampling frame, are also quite small. In this case, current census lists were available to define the population. Non-response, i.e., cases not studied, was 10 out of 1000 and the reasons for missing data are known: 6 cases not followed up because of extra travel to school sites (or micro-film of graduated case unavailable) 2 cases lost by rounding error in the sampling fractions, and 2 clerical errors in not following up on files.

Pupils Staffed But Not Placed

When the complete research study was planned it included details for a special sub-study of pupils who might have been PCD, were given a special education staffing, but who were not placed in special education. The design called for a small representative sample of pupils staffed-but-not-placed to be drawn from the population of such pupils in each sampled district or BOCS. To allow meaningful comparisons with children staffed-and-placed, the sampled cases were to be matched to a sub-sample of the PCD cases by year of staffing and on important demographic characteristics. During preparations for site visits, however, and during some site visits it was learned that many administrative units did not have lists of such cases, did not keep special education files for such children, or in several instances did not have any children who were staffed but not placed. In some districts virtually all cases that reach a formal staffing are placed. Several directors explained in terms like this. "Our mini-staffing procedures are pretty complete. If a child really isn't PCD they're stopped at that point. Of course, something could turn up when the whole team of professionals gets together, but by the time a kid gets to staffing it's pretty unlikely that he won't be placed."

The purpose of the sub-study had been to examine the salient characteristics which distinguished children with academic difficulties who were not placed from those who were identified as PCD. From the prelimininary findings, however, it became clear that this would require a full-scale research effort aimed at collecting information at the time of the mini-staffings or pre-assessment meetings. Therefore, the intended substudy design was not carried out.

Confidentiality of Data

The research procedures followed in this study were in compliance with the Privacy Act of 1974 and the Family Education Rights and Privacy Act of 1974 (referred to as the Buckley Amendment). Directors of Special Education in sampled units were given a summary of these federal acts and a description of the safeguards researchers from the Laboratory of Educational

Research would follow to ensure confidentiality of data.

Through their contract with the Colorado Department of Education, members of the research team were authorized to see personally identifiable information from students' educational records. However, as a special precaution, any coded data taken from the site was identified only by student I.D. number. When copies were made of files for a representative subsample of cases, names of pupils and parents and their addresses were blacked out by clerks on-site. The linkage of I.D. numbers to the original population lists was done on the unnamed lists provided by the Colorado Department of Education. Only the staff in the particular unit could identify students by name from the corresponding name lists.

Whenever a file was looked at, a record-of-access form was added to the file by the researcher. The one-page memorandum stated that the file was consulted, identified the study and how to contact the researchers, repeated that the study was in compliance with federal legislation, and gave further assurance that the child's name and other identifiable information were removed from data collected by the researcher.

Data Collection: Coded and Copied Cases

In each of the participating districts and BOCS, the Director assigned a staff member to help locate files for the sampled cases. Units were told in advance the numbers of the students to be studied so that records housed in the schools could be called into the central office. In a few instances, when the central file was found to be incomplete, copies of the missing information (with names removed) were sent to the researchers following the site visits.

The representative sample of PCD pupil files was randomly subdivided into two separate groups to be analyzed either quantitatively or qualitatively as described in the analysis sections. Within each administrative unit, a 20% subsample was randomly selected. For these cases the entire Special Education file was copied except for parent permission slips and actual test protocols. After all personally identifiable information was removed, these files were used for intensive study and qualitative analysis. The remaining 80% of the cases were coded on-site. These are referred to as the coded cases and are the basis for the quantitative analysis.

Quantitative Analysis. An extensive case file record form was developed to structure the coding of information from individual folders. To describe each PCD child and the procedures used in diagnosing the handicap, variables such as the following were recorded:

- the characteristics routinely reported to CDE including end-of-year status and number of hours served;
- other demographic characteristics including race, socio-economic status and number of parents at home;
- referral information, by whom and for what reasons; recorded narratively as well as by coded categories;
- previous history in special education;
- additional services provided to pupil;
- who attended the staffings and who provided written reports;
- both narrative and coded basis of handicapping condition;
- tests administered as part of initial staffing;
- actual IQ and achievement test scores;
- evidence of perceptual or processing disorders reported independently by each specialist;
- behavioral indicators;
- other causes of academic failure;
- medical indicators;
- exit criteria and staffing procedures.

In addition to the formal coding on subjectively scored variables, researchers also kept marginal notes on what pieces of evidence led to the assigned rating. For example, a child who was coded as having major behavioral problems had this note: "constantly hitting or kicking peers; knocked over chairs, has to be restrained by teacher." This notation appeared in the file of a child who was coded under possible environment causes of academic failure: "has attended five schools in the last three years;" and another had "missed 52 days of school last year and already 30 this year."

The PCD case files were coded by three advanced doctoral students and the principal investigator. Researchers were trained with the data record form and agreed on the interpretation of each variable. The coding form is eight pages long and is annotated to indicate how numerous examples are to be coded. The first 200 cases coded were more extensively documented to allow for verification of consistency between coders. These cases were also reread after all 790 cases had been completed to ensure that there had not been drift in any of the ratings from early to later cases.

Reliability and Validity of Case File Analysis

A supplemental study was conducted to test the accuracy of the methods used to code and quantify material from the PCD case files. This study also assessed validity--defined as the ability of the quantitative analysis to capture the reality of the process of PCD identification and placement.

In 1979, Dr. Smith conducted a case study of the PCD staffing process (Smith, 1979). Part of that study involved following three children who had been referred for evaluation as PCD, reviewing their assessment data, interviewing their parents, school staff and professionals involved with their evaluation, and observing the staffing conference. For purposes of checking reliability and validity of case file analysis in the present study, the school district involved in the Smith study was asked to provide the case files from these three pupils. These files were not a part of the probability sample of case files. The three files were then coded by the three individuals who had coded the entire sample of case files. The coders were instructed to use the same procedures they had used previously. Coding was done independently by the three. They submitted the completed coding forms for a reliability analysis by Dr. Smith, who also judged whether any essential information about the case was missed by the coders or not available in the case files maintained by the district.

Reliability. A high degree of coder reliability was obvious by simple inspection. Thus, the more esoteric elements of reliability theory could safely be ignored (cf. Stanley, 1961).*

Agreement among the three raters was measured by calculating the percent agreement between each of the three possible pairs of raters. For example, among raters A, B, and C on item *i*, one can compare A vs. B.

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*Usually one would need to consider the overall rate of occurrence of a phenomenon in determining reliability. For example, ten observers may agree on 99 percent of the years that Halley's comet has or has not occurred even though each claims to have seen it in a different year, because they agree that in most years it did not occur.

A vs. C, and B vs. C. Suppose their ratings are as follows:

	rater	A	B	C
item i		Yes	Yes	No

of the three pairs, two are discordant (viz., A vs. C and B vs. C).

On the case file coding sheets there are 242 items of information. Therefore, there are 242 (items) x 3 (cases) x 3 (rater combinations) for a total of 2178 possible comparisons. Of these 2178 comparisons, the following numbers and types of discordance were found:

Type of Discordance	Number (N) of Discordance	% Discordance N/2178	Reliability (100% - % Discordance)
1. Where information was present in both raters, but information was contradictory	14	.6%	99%
2. Where information was coded by one rater, but left blank by the other.	76	3.4%	97%
3. Either 1 or 2	90	4.1%	96%

Validity. Information in the files of the three pupils was remarkably complete. The scores from all the tests given in the evaluation and placement of the three were available in the file for the coders to read, and they were accurately recorded. Information on the reasons given for referral and placement were correctly recorded as were composition of the staffing team, tests used, ability and achievement test scores, presence of medical indicators and "other known causes of academic failure." There were some problems in representing evidence of perceptual and processing deficits and whether these deficits had been cited in the over-all determination of handicapping condition. That is, the processing evidence that was presented during staffing was equivocal in the first place, was poorly written up in the staffing summary, and this confusion was reflected in parallel confusion by the coders. (Almost all the discordances were produced in these variables). What was lost in the coding was the historical context of the case. This occurred because the coders were to read and quantify only those parts of the file that related to the "primary staffing" or the evaluation that led to the pupil's current placement. Many pupils have long histories of attention from special education, as is shown in the qualitative analysis. Also missed in coding were the personal conflicts and debates surrounding evidence and placement decisions and information about preliminary in-school conferences and mini-staffings. In general, however, the coding methods captured the essential features of these cases. Errors of measurement have made only a small effect on estimates of the important characteristics of the population of PCD case files.

Once the case record coding forms had been completed on the 790 PCD files, the data were transferred to IBM coding sheets and then punched on computer cards. A variety of procedures to check for coding and punching errors was carried out. These included systematic checks at each stage on every 20th case and complete follow-up of any consistent error. Once data files had been created in the computer, all variables were searched for "out of range"values and the original data were reexamined.

After simple statistics such as means and proportions were computed on all of the coded variables, key variables were identified for secondary analysis. For example, raw counts on the numbers of IQ tests administered are not directly interpretable because some children received as many as two or three tests. Therefore the data were rerun in answer to the question, "how many PCD children had one or more high quality IQ test?"

Variables were also constructed for each case from combinations of original variables. For example, using separate norms tables for each test and grade level, coders re-read the cases and computed standard scores for each IQ and achievement test. (Standardization is necessary to correct for the differences in metrics of the various tests.) The computer could then be used to calculate discrepancies between IQ and achievement on each pair of tests. Discrepancies were tested for the reliability of the differences using two levels of statistical significance. Cases were then identified that had at least one significant discrepancy or that had the same discrepancy (i.e., in reading) confirmed by a second test. Years-below-grade level indices were also computed for each child by subtracting obtained grade-equivalent scores from grade-placement at the time of testing. This was done separately for each achievement test administered at the time of the initial assessment and also averaged across tests. Many analyses of this type were done; they are described in the results section in conjunction with each finding.

Standard errors in estimating population values were calculated and used to establish confidence intervals on all of the key reporting variables. The estimation of standard errors was complex because of the multi-stage cluster sampling design. The derivation of these estimates is explained in the technical appendix. Given the sampling strategy used for the study, two different forumlations were possible for establishing the weights and for calculating the standard errors: a ratio-to-size estimator or an unbiased estimator (Cochran, 1963). Because we wished to report statistics for subclasses of pupils (for example, the proportion of children with processing deficits cited who also have significant ability/achievement discrepancies) it was necessary to use the unbiased estimator. This method was generally more conservative, i.e., had the effect of creating slightly larger confidence intervals, and was therefore used across the board even for those instances where the more appropriate estimator would have made the reported values look slightly more stable.

Characteristics of the Sample

The data in Table 2.1 are basic descriptive characteristics of PCD children in Colorado. The proportions reported for mode of service delivery, end-of-year status and sex, etc. were estimated for the entire PCD population from the proportions in the representative sample. An important feature of the starred variables is that they were obtained from the population lists submitted to the Colorado Department of Education. This means that when population results are reported for all the units in the state, they can be compared to the estimated values to check directly for the agreement of the inferred results to the actual numbers.

Qualitative Analysis

Two hundred case files from the probability sample of one thousand were selected at random for the qualitative analysis. This procedure involved a thorough reading of each case by either Dr. Shepard or Smith. The cases were read with the general goal of obtaining as complete understanding as possible of each case: what happened during the entire history of staffing (the history of some pupils extended over eight years and involved multiple evaluations and placements), who participated in referral,

Table 2.1

Characteristics of PCD Pupils in Colorado for 1979-80
Estimated from the Study Sample

Mode of Service Delivery*	Estimated Population Percent	Age Group and School* Level	Estimated Population Percent
Consultation-Regular Classroom	5.0	Ages 0-2 (Preschool)	.1
		Ages 3-4 (Preschool)	.1
Itinerant	6.8	Age 5 (Preschool)	.5
Resource Room	77.1	Ages 5-17 (Grades K-8)	74.6
Self-contained	6.7	Ages 5-17 (Grades 9-12)	20.5
Work-Study	1.2	Ages 18-21	1.1
Missing Data	3.2	Missing Data	3.2
	100.0		100.0

Entry Status*	Estimated Population Percent	End-of-Year Status*	Estimated Population Percent
Carried Over	64.9	Staffed out, goals accomplished	9.7
New This Year	31.9	Transferred out of District	5.4
Missing Data	3.2	Retained in Special Education	72.9
	100.0	Withdrawn from Special Education	2.2
		School dropout	1.8
		Graduated	3.8
		Other	.9
		Missing Data	3.2
			100.0

Sex	Estimated Population Percent
Male	67.5
Female	32.5

Table 2.1 (continued)

Characteristics of PCD in Colorado for 1979-80 Estimated from the Study Sample

Hours in Program During 79-80*	Estimated Population Percent
1 - 90	34.1
91 - 180	28.3
181 - 270	11.0
271 - 360	9.0
361 - 450	2.9
451 - 540	1.3
541 - 630	1.5
631 - 720	1.6
721 - 810	.5
811 - 900	.8
901 - 990	.7
Missing Data	8.3
	100.0

---

*Starred items were obtained from the Colorado Department of Education and will be reported for the entire population forms for the sampled units, thereby providing a check on the adequacy of sample characteristics for representing population values.

evaluation, decision-making, follow-up and treatment, what test sources of data were drawn upon, what the remedial program consisted of, and whether the pupil was ever dismissed with his objectives having been achieved.

In carrying out this analysis, we followed the procedures of Glaser and Strauss (1967) who suggested that large amounts of narrative data can be analyzed by deriving categories (patterns or variables) from sections of the data, refining and defining them with other parts of the data, and finally deriving hypotheses that explain the relationships among categories. This is a method of data analysis quite different from that used in experimental and survey research, wherein hypotheses are drawn from established theory and data are generated and analyzed to test the hypotheses. The qualitative analysis of case files is not meant to test or confirm hypotheses, but to generate them. In this way the researchers' and readers' understanding about the phenomenon under study is increased.

Having studied twenty files to gain general understanding, we derived five research questions, (what Glaser and Strauss call "categories") and used them to investigate the remaining case files. These categories are as follows:

1) Statistical significance of the discrepancy--The standard error of the difference between general intellegence and educational achievement was computed to see if each case file met the operational definition of perceptual/communicative disorders. The significance of differences among subtests that clinicians used to interpret variability of separate intellectual and perceptual abilities were computed or estimated. These calculations followed the recommendations of Salvia and Ysseldyke (1978).

2) Consistency--we looked for evidence that when different clinicians evaluated the same child they produced consistent, reliable patterns of that child's abilities and behavior. We looked to see that when one clinician used more than one source of data on a pupil, that all the sources of data yielded the same picture

of the child's abilities and behaviors. We concentrated particularly on whether different clinicians or sources of data produced conflicting conclusions; e.g., when the psychologist found visual processing problems and the educational diagnostician found auditory but not visual problems, or when the Wide Range Achievement Tests and the Peabody Individual Achievement Test gave widely discrepant pictures of a child's performance. When the pieces of information diverged we looked for evidence that the professionals had acknowledged the contradictions and attempted to resolve them in favor of the more consistent or valid data sources.

3) Marginal Placements--we assessed, based on the significance of the ability/achievement descrepancy, the history of the case, and the patterns of ability test scores whether the child's problem was severe or mild, if the problem was so pronounced that no subjectivity or inference at all was involved in the placement decision, or if it was a toss-up to determine whether the child should be placed.

4) Need for Special Education--we assessed whether or not the child really needed help beyond that which could be gotten in the regular public school classroom. Further we assessed whether some kind of treatment other than a resource room or self-contained class for learning disability might be needed.

5) Cluster--Based on our initial reading it was apparent that some cases met neither the operational definitions for PCD in the state specifications nor the clinical patterns of learning disabilities described in the professional literature. We attempted to categorize these further, and the resulting subcategories we referred to as clusters or "implicit definitions" of learning disabilities. For example we found pupils who best fit the label "slow learner" or even were borderline retarded. Others were clearly emotionally disturbed. Some were primarily disabled by medical, vision, or hearing problems. Still others

fell into the "language interference" category. Some we judged to have no handicap at all, thus falling into no category. Others, of course, were learning disabled either by the operational criteria or the clinical criteria. Children in all these categories were staffed and placed as learning disabled, so that they met some clinician's "implicit definition" of that category.

After reading and analyzing the data and sorting the cases into these categories, several hypotheses were formulated. No attempt was made to test these hypotheses on these data since that would be circular. However, we looked for disconfirming instances to refine our hypotheses. We engaged in triangulation with data generated in the quantitative analysis of cases and in the survey of professionals.

The results of the qualitative analysis of cases are presented in two forms. A table of frequencies of the cases falling into each category is presented along with findings and hypotheses from the entire analysis. Second we have written ten case histories of children whose PCD files were selected from the two hundred qualitatively analyzed. The ten comprise a quota sample, chosen to be typical (not representative in the statistical sense) of the range of cases. The case histories are real cases and are written in the journalistic fashion so that any lay person or professional can understand them. We have described all the essential details available in the file and presented our analysis of the meaning of the initial staffing. These reports are presented in the section on Findings.

The reader should be aware of two assumptions made in the qualitative analysis. First, we did not question the validity of the tests used or of the validity of test profile analysis so commonly used in PCD evaluations. Both validities have been questioned (Coles, 1978; Salvia & Ysseldyke, 1978) and we examine the technical issues in other parts of the report. Second, we did not question the appropriateness of the PCD remedies for children judged to be PCD. Programs vary, some are much like educational tutoring, others try to alter basic perceptual abilities, some emphasize emotional support. For the purpose of the qualitative analysis we assume that the Special Education teacher selected the appropriate treatment and that it was effective. The validity of this assumption has been challenged (Arter and Jenkins, 1979; Kavale & Mattson, 1980) and will be examined in other parts of the report.

Survey of Professional Opinions and Practices

Purpose

Questionnaires were sent to learn the attitudes and practices of important groups of professionals involved in the identification of PCD pupils. Opinions about how assessments are made can not stand in the place of evidence of actual assessments in case files. However, opinions provide important collateral information about how general definitions and guidelines are translated into placement decisions.

Population Identification and Sampling

The professional groups of interest were PCD teachers, school psychologists, social workers, speech-language specialists and school principals. The first four groups of specialists conduct most of the assessments of potentially handicapped children; together with school principals they are represented at nearly all staffings.

Special Education Directors in the 22 sampled units supplied lists of personnel in these five groups for the 1980-81 school year. The population was considered to be all professionals in these categories unless their assignment precluded their ever being involved with the assessment of PCD children; for example, a speech-language specialist who worked full-time at a center for the trainable mentally retarded was not counted as part of the population. Such cases were less than 5% of the population. The personnel lists constituted the sampling frame for the second stage of sampling. Again, because larger districts and BOCS had been given a much higher probability of being selected in the first stage, the lists of professionals in each category were more than half the corresponding populations in the state.

Because the total numbers of social workers, psychologists, and speech language specialists in the sampled units were relatively small, i.e., less than 250, all of the members of these groups were selected. Thus, there was no sampling at the second stage for these three categories. For PCD teachers and school principals, an 80% sample was drawn at random for each of the participating units. Population and sample sizes are shown in Table 2.2 along with return rates.

Because the samples for the questionnaires were such large proportions of their respective professional populations, the errors introduced by sampling are relatively very small. The weighting procedures and methods for calculating standard errors are the same as those described for the study of pupil files and are explained in more detail in the technical appendix. The small absolute size of the sampling error is reflected in the narrow confidence limits reported with findings from the questionnaires.

Return Rates

The issue of return rates is discussed in conjunction with population sampling because nonresponse is potentially the biggest threat to the validity of survey research. Regardless of the precision of the original sampling design and estimation procedures, a large percentage of nonresponse can cast doubt on the study findings because one can never assume that the answers of the nonrespondents would parallel those of the respondents.

Extensive efforts were made to elicit a high rate of return. Questionnaires were distributed to school addresses often with an additional cover letter from the Director of Special Education emphasizing the purpose and the importance of the study. Questionnaires were returned directly to the researchers in pre-paid envelopes. Records of daily returns were kept, and when the rate tapered off (after one month) a follow-up postcard was sent including a phone number for requesting an additional copy of the questionnaire.

A core sample of 20% was randomly selected for intensive follow-up from the original lists of professionals sampled. Individuals on the core

Table 2.2

Population, Sample Sizes and Return Rates for the Questionnaire Survey of Five Groups of Professionals Involved in Assessment and Staffings of PCD Children

	PCD Teachers	Social Workers	School Psychologists	Speech/Lang. Specialists	School Principals	Totals
Estimated Population Size Based on 1979-80 CDE Head counts	1584	356	348	492		
Sampling Frame Size: Population in 22 Sampled Units	898	217	176	240	649	2180
Sample Size 80% or 100% of Population in Sampled Units	674	217	176	240	499	1806
Number of Returned Questionnaires	542	160	130	179	414	1425
Percent of Returned Questionnaires	80.4%	73.7%	73.9%	74.6%	83.0%	78.9%
Core Sample Size 20% of Original Sample for Intensive Follow up	135	41	35	50	100	361
Number Returned in Core Sample	118	31	29	41	91	310
Percent Returned in Core Sample	87.4%	75.6%	82.9%	82.0%	91.0%	85.9%

sample who had not returned their questionnaires were telephoned and encouraged to send them in. New copies of the questionnaires were sent to those who requested them.

Return rates for both the entire and core samples are reported in Table 2.2. Overall the percentage of returns was 79% for the full sample and 86% for the core sample, a high rate of return for this type of survey. From the follow-up phone calls and notes returned with incomplete questionnaires, it was learned that a few professionals had been sampled inappropriately. For example, a teacher of the Educationally Handicapped who works exclusively with emotionally disturbed children was not included in our definition of the population and would have been excluded from the sampling frame if this assignment had been apparent on the original personnel lists. Rather than redefine the population after the fact, however, the original numbers are reported; it should be noted that appropriate adjustments in the sampling frame counts would increase the reported return rates by about 1%.

Phone conversations with the representative core sample and occasional notes sent in allow us to report some of the reasons for not responding: the two largest groups of nonrespondents were those who did not have time or who said they felt they did not know enough about the definition of PCD and assessments to answer the questions. The latter group of respondents felt they should not have been sampled; in some cases, especially in larger districts they might have met our criteria for exclusion from the population. In other cases, however, they were just new to the job and were expected to participate in assessments and staffing decisions. Therefore, they were definitely part of the population to which we wish to generalize. When findings are summarized for questions, based on knowledge of the identification process, such as the validity of tests, it should be remembered that results may have a slight positive bias because of the non-response of this group. A very small number of nonrespondents said they would not fill out the questionnaire either because they did not believe in questionnaire research or because they feared the purpose and the effects of this particular study. How actual answers from individuals in this group would compare to obtained results cannot be predicted. However, the effect is exceedingly small since the numbers were a small portion of the 14% nonrespondents in the core sample.

Analysis of Late Returns

The core sample was a representative 20% random subsample of the original professional samples. Individual phone calls were made to participants in the core sample who had not responded by the 21st day of the survey. As shown in Table 2.2, the intensive follow-up for the core sample increased the rate of return by 7%. The following analyses were done to determine whether these additional respondents were similar to those answering in the total group or were different in some way.

The data for each total survey were divided into core and not-core groups. Each group was then further subdivided into those who returned their questionnaires before the day calling began and those who returned it after. Since the core and not-core groups could only have differed by sampling error before the follow-up phone calls began, these cases were excluded from the analysis. The differences between core and not-core groups after calling were tested for statistical significance ($\alpha = .10$). The majority of questions showed no difference between groups suggesting that late returns from the encouraged group elicited more responses of the same type and did not change the nature of general opinion trends. For this reason data from the two groups are pooled for all the professional survey analyses. In the report of findings, for those questions with a significant effect,* the direction of the trend is used in the narrative to adjust the obtained results for what would be expected if an additional 7% of the non-core sample had responded. For example, PCD teachers in the core sample who responded after the follow-up phone call, were more likely to say that the rules for the identification of PCD should be made less strict. This could have an effect as large as 1% or 2% especially if the trend were extrapolated to remaining non-respondents.

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* Statistically significant at $\alpha = .10$ and a practical effect-size of more than .5 standard deviations.

Analyses were also done to make tentative projections about the nature of non-respondents' opinions. Some professionals who received the questionnaires decided when they first received it that they would not respond. Opinions of this type of respondent cannot be projected from an analysis of late returns. However, some resondents put off responding with the intention of responding eventually and may hold similar opinions to those who returned the questionnaires very late. We looked for trends in the data that would allow us to make predictions for this subgroup among the nonrespondents. (The reasons given by those who refused to participate were given in the previous section.) Correlations between day-of-return and opinion were computed for 25 key variables in each survey. Very few of the correlations were significant (none were significant on the PCD teachers questionnaire). When statistically significant correlations were found they were of no practical import, never more than $r = .16$. For example, the later psychologists returned the questionnaires, the more they reported using the Bender Gestalt test ($r = .13$). Because these trends were negligible they are not used in the text to adjust findings for possible effects from non-respondents (who are like late respondents). This analysis lends confidence to the interpretation of survey results. It suggests that for a large group of non-respondents, the accuracy of population findings would not be altered by their response or non-response.

Instrumentation

Five questionnaires were developed by the research team for administration to the sampled professionals. The literature in learning disabilities was reviewed to identify issues and to glean specific questionnaire items. Several items were taken directly from "A Survey of Attitudes Concerning Learning Disabilities" by S. A. Kirk, P. B. Berry, and G. M. Senf (1979). Credit for these items is documented on the questionnaires. Additional items were modified versions of questions taken with permission and from the study of Applied Management Sciences, entitled Study to Evaluate Procedures Undertaken to Prevent Erroneous Classification of Handicapped Children.

Copies of the actual questionnaires appear in Appendix C. The principals' questionnaire was the shortest and was more focused on issues of policy. The following general topics were addressed:

- Definition of Perceptual Communicative Disorders
  including conceptual definition of one handicap; administrative mechanisms for providing special help, and operational criteria such as years-below-grade level.
- Identification Process
  including the influence of various professionals, parents' rights, an overall validity rating and tradeoffs between accuracy or due process and staff time.
- Financial Resources
  need and opinions about funding policy
- Costs
  measured in personnel time
- Exit Criteria
  procedures and indicators for staffing a child out of a PCD placement.

The specialists' questionnaires touched on all of the above issues except those about fiscal policy. They had additional questions elaborating on the definition of PCD and operational indicators. Because social workers do not generally administer tests, they were not asked to report on testing practices. School psychologists, speech-language specialists and PCD teachers, however, were given a list of tests and asked to indicate how frequently they used each test and their knowledge about reliability and validity of each. Finally, PCD teachers and speech-language specialists were asked about the types of instructional intervention they provide to PCD pupils.

The questionnaires were pilot tested with small samples of specialists in administration units that were not part of the randomly selected sample. A few ambiguous or otherwise objectionable items were deleted. The revised questionnaires were then reviewed by an advisory committee of Special Education Directors convened by the Colorado Department of Education. As a result of this review, a few items were rewritten, the format was improved, and a small number of new items was added. The questionnaires were also reviewed by members of the Data Acquisition Review & Utilization (DARU) Committee. Their advice resulted in changes in the cover letter, correction of some items, and deletion of two items. The questionnaires bear the DARU Recommended Stamp of Approval.

Data Analysis

When questionnaires were returned, the data were transferred to IBM coding sheets and then key punched on computer cards. In addition to having all of the keypunching verified, every 20th case was checked with the original data to ensure that transcription errors were not introduced into the data. As was done with the PCD pupil file, the computer was used to search for out-of-range values. The error rate was less than .01%.

To allow for qualitative analysis of the few open-end questions, separate copies were made of comments so that they could be sorted into categories of responses. Quotations were used to typify various positions.

Master questionnaires were also developed to maintain a record of all marginal comments on the quantitative items. Questions which elicited similar complaints about how the question was to be interpreted were omitted from the results (or were modified by a summary of the comments).

Descriptive data in the form of frequencies, means, medians, and measures of variability were computed. Standard errors of these estimates were calculated as described in Appendix A and used to construct confidence intervals when using the sample data to describe the entire populations of professionals in Colorado.

A factor analysis was done of the PCD teacher questionnaire using the principal components method (with eigenvalues = 1.0 in the diagonal) and an oblique transformation. The factor analysis produced clusters of items which are highly related. In the reporting of results, this permits the use of fewer key questions which represent each of the identified factors.

3

DEFINITIONS OF PERCEPTUAL AND COMMUNICATIVE DISORDERS

Two formal definitions govern the identification of children with perceptual and communicative disorders in Colorado. The state definition given in the 1976 Rules for the Administration of the Handicapped Children's Educational Act is as follows:

> 1.01 (6) Perceptual or communicative disorder:
>
> A perceptual or communicative disorder is indicated when there is a significant discrepancy between estimated intellectual potential and actual level of performance and is related to basic disorders in the learning processes which are not secondary to limited intellectual capacity, visual or auditory sensory impairment, emotional disorders, and/or experiential information. One or more of the following measurable disorders are observed.
>
> 1.01 (6) (a) Significantly impaired ability in pre-reading and/or reading skills
>
> 1.01 (6) (b) Significantly impaired ability in reading comprehension
>
> 1.01 (6) (c) Significantly impaired ability in written language expression, such as problems in handwriting, spelling, sentence structure and written organization
>
> 1.01 (6) (d) Significantly impaired ability to comprehend, apply and/or retain math concepts. (p. 4)

The Colorado definition closely parallels the federal definition of specific learning disabilities given below. This current definition from Public Law 94-142 is very nearly the same as the earlier statement from the National Advisory Committee on Handicapped Children of the U.S. Office of Education.

> "Specific learning disability" means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.
>
> (U.S.O.E., 1977, p. 65083)

Key Elements in the Definitions

Operational criteria and issues about how to measure the characteristics of a PCD child are presented in later sections. The purpose of this section is to examine the conceptual meaning of the definitions. What are the key elements that guide our understanding of perceptual and communicative disorders?

Significant Discrepancy Between Ability and Actual Achievement. A central idea underlying the concept of learning disabilities is that the child's true potential is much higher than he is able to demonstrate on achievement measures because of interference from the disability. The discrepancy component may be thought of as a particular kind of severe underachievement. In the professional literature, many authors note that, along with the notion of a processing disorder, an achievement-ability discrepancy is a major defining characteristic of learning disabilities (Bateman, 1964; Harber, 1980; Mercer, 1979). The salience of the discrepancy element is explicit in the Colorado definition. Although discrepancy is not mentioned in the USOE definition, it is heavily emphasized in the criteria which accompany that definition:

> (a) A team may determine that a child has a specific learning disability if:
>
> (1) The child does not achieve commensurate with his or her age and ability levels in one or more of the areas listed below...when provided with learning experiences appropriate for the child's age and ability levels; and

(2) The team finds that a child has a severe discrepancy between achievement and intellectual ability in one or more of the following areas:

(i) Oral expression;
(ii) Listening comprehension;
(iii) Written expression;
(iv) Basic reading skill;
(v) Reading comprehension;
(vi) Mathematics calculation; or
(vii) Mathematics reasoning.

(U.S.O.E. 1977, p. 65083)

Processing Disorder. Although learning disabilities are expected to be manifested as severe discrepancies between achievement and potential, the more fundamental cause of the disability is believed to be some breakdown in the basic psychological or learning processes. These processes are defined differently by various authors but generally are inferred from an information processing model of human learning (Chalfant & King, 1976; Torgesen, 1979). The observable steps in the learning model are sensory input and response. Psychological processes (such as integration, problem solving, memory, and discrimination) are the intervening functions which are presumed to transpire in the brain. Most authors agree that the concept of deficiency in the psychological processes needed for learning is essential to the definition of learning disabilities (Mercer, Forgone, & Walking, 1976; Torgesen, 1979). The concept is important for distinguishing learning disabled children from other poor achievers even though, as will be discussed later, there are virtually no valid methods for measuring processing deficits (Coles, 1978; Hammill, 1978; Salvia & Ysseldyke, 1978). Furthermore, the idea of a processing deficit is integral to the meaning of learning disabilities even if research evidence shows little success for instructional programs designed to treat deficient learning processes (Arter & Jenkins, 1979; Goodman & Hammill, 1973; Hammill, Goodman & Wiederholt, 1974; Smead, 1977). The clause in the Colorado definition of perceptual and communicative disorders referring to "basic disorders in the learning processes" corresponds to the mention in the federal definition of a "disorder in one or more of the basic psychological processes." The absence of any reference to processing deficits in the federal criteria for operationalizing this component reflects the problems of trying to measure basic processes (Harber, 1980; Serf, 1978).

Exclusionary Clause. The exclusionary clauses in both the Colorado and federal definitions rule out other handicapping conditions which may result in poor school achievement but should not be mistaken for a learning disability. These stipulations emphasize the importance of the discrepancy and processing dysfunction elements in the definition. For example, if identifiable impairments of vision or hearing are sufficient to explain poor achievement, there is no reason to infer processing dysfunctions, hence there is no learning disability; such a child might, however, be eligible for special services because of a vision or hearing handicap. The exclusion of emotional causes of poor achievement further emphasizes that learning disabilities are attributable to processing disorders rather than to other known causes of academic failure. Note that perceptual and communicative disorders are defined as intrinsic dysfunctions in the child and not as debilitating circumstances in the child's environment. Although not stated explicitly, the exclusions are generally understood to rule out learning problems caused by severe motivation problems, excessive absences and poor instructional opportunities.

Achievement Deficit

There is some disagreement in the field as to whether academic failure is a prerequisite for the determination of a learning handicap. Chalfant and King (1976), for example, consider learning disabled children as a subset of "all children who are having difficulty acquiring academic skills, regardless of cause." (p. 35). This reasoning suggests that a child with above-average ability, with a significant discrepancy and with evidence of a processing dysfunction, but with average achievement should not be considered learning disabled. Conversely, Cruickshank wrote that "learning disability is a respecter of no intellectual level" (1977, p. 54). If this were the guiding concept, then a very bright child with average achievement could be considered disabled if the discrepancy between potential and achievement were significant.

The federal definition includes only the element of discrepancy between achievement and potential; it does not specify what the resulting absolute level of achievement should be to constitute a disability. The Colorado definition follows suit. However, supplemental criteria and policies in some districts stipulate that a perceptual or communicative disorder must involve significantly impaired performance in one of four school learning areas. That is, in addition to a discrepancy and evidence of a processing disorder, the child's level of academic performance must be seriously deficient to be considered a handicap.

Perceptual Disorder

It should be apparent from the above discussion that the Colorado category of perceptual and communicative disorders is essentially identical to the federal definition of specific learning disabilities. The two definitions have different labels, however, which seems to imply a distinction. Some authors use the term perceptual disorders almost interchangeably with learning disabilities. When perceptual abilities are used to refer to mental or neurological processes as the source of learning disabilities (see Wepman, Cruickshank, Deutsch, Morency, Strother; 1976) they mean the same as the psychological processes discussed above. Other experts complain that perceptual handicaps should not be equated with learning disabilities because it is possible for a child to suffer a brain dysfunction without dysfunction in any perceptual process (Johnson & Myklebust, 1967).

Since the perceptual and communicative functions, referred to in the Colorado labels, together comprise all of the information processing functions usually referred to as psychological processes, the Colorado definition is as inclusive as the federal definition. Further, since nothing in the Colorado definition distinguishes its meaning from the federal definition the two statements should be treated as variations of one idea.

Criteria in Individual Special Education Units

"*State Guidelines*." The only formal criterion for identifying Colorado's perceptual and communicative disorders is the short definition already quoted from the 1976 Rules. *A striking finding from the Directors Interviews, however, is that many districts believe that they are following additional state guidelines legally in force. These "criteria for eligibility" are reported in Table 3.1*. They were disseminated to units as an example in the sample Comprehensive Plan. In the representative sample of units, half of the directors specifically said they were following these state guidelines. Only two of these referred to the source as a tentative document; for example, "we're following the definition outlined in the CDE Description of a Comprehensive Plan" and "we're using CDE's Draft 1977 Standards and Guidelines." Others said, "We're trying to adhere to the state guidelines." and "We go straight from the state guidelines." Those in this group who also had Comprehensive Plans on file repeated the criteria in Table 3.1 word-for-word (or made small modifications in one case.)

The *de facto* state guidelines are conceptually congruent with the formal Colorado definition only up to a point. They contain serious deficiencies, however; and they add new elements which diverge from the conceptualization in the rules without rationale and without apparent recognition of the change in meaning. First, the criteria are missing essential conjunctions. Nowhere is it indicated whether to be considered PCD a child must have both a *and* b or either a *or* b. Second, by providing a criterion for identification of a processing deficit that is in relation to an age-norm

TABLE 3.1

Criteria for Eligibility*

To be determined Perceptual/Communicative handicapped, a child must:

(a) Consistently exhibit a processing deficit. A processing deficit should be defined as a significant impairment in one or more of the following:
Reception, discrimination, association, organization/integration, retention, or application.

Significance should be determined by:

Use of standardized instruments: Significance should be determined by standards established by the instruments and of the following magnitude:

Below Age Norms

Ages

3-8 - 1 year
9-12 - 1½ years
13-21 - 2 years

Use of informal assessments: Significance should be determined by discrepancy from developmental norms of the following magnitude:

Ages

3-8 - 1 year
9-12 - 1½ years
13-21 - 2 years

(b) Exhibit significant educational deficit in one or more of the following areas:

Reading readiness/skills
Reading comprehension
Written/oral language
Math

A significant educational deficit should be defined as achievement at the tenth percentile on a nationally normed test of individual achievement with average intellectual potential.

Achievement at the tenth percentile on a nationally normed test of individual achievement times estimated intellectual potential - handicapped achievement level.

If there are not state or national norms for the evaluation techniques used to determine achievement levels, the judgment of the staffing team may be accepted as evidence that the student is functioning at or near the tenth percentile.

All staffing team members agree, in writing, the student is functioning at or near the tenth percentile of expected achievement.

Each staffing team member specifies, in writing, the evidence that supports the conclusion that the child is functioning at or near the tenth percentile of expected achievement.

In the event that the staffing team members all agree that a child has a perceptual or communicative disorder, but a severe discrepancy between achievement and intellectual ability is not indicated, the staffing team may determine that the student has a perceptual or communicative disorder provided that, in addition to the staffing team report, each staffing team member states in writing:

(a) The specific factors presented in the evaluation which leads the staffing member to the conclusion that the student had a perceptual or communicative disorder.

(b) The extent of the deviation of academic achievement (in one or more of the areas of reading, reading comprehension, written/oral language or math) from the severe discrepancy level established in II-B.

*Section IX: Criteria, in the sample Comprehensive Plan sent to districts.

expectancy, these guidelines contradict the discrepancy element in the definition which is in relation to "intellectual potential". This technical contradiction will be explained further in Chapter 5 but basically occurs because children with below average intelligence will tend to have below average processing abilities. Third, part b of the criteria introduces the notion of absolute deficiency--at the tenth percentile--presumably in addition to a significant discrepancy from the individual's ability level. Finally, the guidelines allow that professional judgment can be used to establish both processing and educational deficits without specifying why PC disorders can sometimes only be identified clinically and what rigorous procedures should be followed to verify such diagnoses.

Unique Definitions and Criteria

In identifying PCD children, the great majority of districts and BOCS simply follow the Colorado definition from the 1976 Rules or use this plus the "state guidelines." Some directors mentioned that they follow the state definition plus use staff discretion. One director noted that in addition to the state guidelines, "guidelines also come from where each professional was trained." Only a few units (6 in our sample, projected to 12 or less statewide) have formally adopted their own guidelines and criteria to augment the state rules or are in the process of doing so. These units are almost exclusively larger districts with student populations of 12,000 or more and with correspondingly larger staffs of special education professionals.

Districts with their own guidelines have not departed significantly from the Colorado definition of perceptual and communicative disorders. A small number of units have retained the learning disabilities label and/or emphasize the federal criteria. In general, individual district criteria are more specific in operationalizing the components of the PCD definition. Especially, several existing or draft documents provide numerical tables for judging the significance of a discrepancy between measures of achievement and intelligence. The only definitional issue which emerges from consideration of these documents is one which also distinguished the de facto guidelines from the formal Colorado and federal definitions, i.e., that a child must have an absolute as well as relative deficit to be considered handicapped. In some districts which emphasize the discrepancy component a child with above average intelligence but with average achievement could be considered disabled, whereas in other districts above average children are specifically excluded unless their performance falls significantly below grade level.

Professional Opinions Regarding Definitional Issues

Professionals who participate in the identification of PCD children were surveyed to ascertain their opinions about the conceptual definition of PCD and the factors they believe are important in determining the existence of the handicap. To facilitate interpretation of the results, the questionnaire data (for questions pertaining to definitions and criteria) were factor analyzed. This procedure, described in Chapter 2, groups highly related items on the basis of their intercorrelations. This analysis allows simplification of the discussion of findings by focusing on a more manageable number of questions.

The factor analysis of PCD teachers' answers produced 21 separate and interpretable factors.*

Responses to key definitional questions are presented in Table 3.2. For example, Question 1 about the neurological origins of PCD is controversial. Attributing PC disorders to neurological dysfunction is not part of the current definition. However, it does reflect the original thinking behind the development of the concept of learning disabilities. A majority of the professionals surveyed agreed that perceptual and communicative disorders are the result of neurological impairments. A substantial percentage, however, were neutral or rejected the idea.

The data in Table 3.3 are the responses of professionals indicating how critical various factors are in identifying children as PCD.

The questionnaires to PCD teachers, social workers, psychologists, and speech-language specialists included a list of 27 factors that might be considered in evaluating a handicap. Specialists were asked to rate

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*This is an unusual finding in itself. Ordinarily factor analyses produce only a few factors for a cognitive test and rarely more than 10 on an opinion survey of even 100 items. A result of 21 factors reflects the complexity of definitional issues and diversity of opinion about them.

Table 3.2

Questionnaire Responses to Key Definitional Questions From PCD Teachers, Social Workers, School Psychologists, Speech/Language Specialists, and Principals

			Strongly Agree 1	2	3	4	5 Strongly Disagree
1.* **	In my opinion, perceptual and communicative disorders are the result of neurological impairments.	PCD	9%	43%	32%	13%	2%
		SW	9%	30%	37%	18%	5%
		Psych	7%	46%	31%	11%	5%
		S/L	8%	35%	28%	24%	2%
2.*	A PCD child can be distinguished from a slow learner.	PCD	33%	55%	7%	3%	1%
		SW	26%	56%	7%	8%	2%
		Psych	25%	62%	8%	3%	2%
		S/L	34%	51%	9%	5%	2%
		Prin.	20%	52%	11%	13%	2%
5.*	A formula (e.g., including factors such as mental age, achievement and age) can reasonably be used to determine if a perceptual or communicative disorder is present.	PCD	2%	35%	23%	31%	8%
		SW	5%	33%	25%	27%	10%
		Psych	2%	25%	19%	38%	16%
		S/L	4%	32%	22%	26%	15%
9.	A child who is having academic problems but who is dominant in a language other than English should be excluded from PCD because linguistic differences probably explain the learning problem.	PCD	8%	12%	17%	46%	17%
		SW	3%	12%	14%	38%	34%
		Psych	4%	15%	14%	39%	28%
		S/L	6%	22%	18%	40%	14%
		Prin.	5%	19%	15%	43%	17%
10.	A child who has been absent for more than 30 percent of the school days should not be identified as PCD since the missed instruction probably explains the severe deficit in achievement.	PCD	4%	17%	24%	44%	11%
		SW	3%	13%	13%	41%	29%
		Psych	3%	20%	14%	43%	19%
		S/L	7%	24%	19%	38%	12%
		Prin.	3%	18%	14%	43%	20%

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*Starred items were adapted with permission from "a Survey of Attitudes Concerning Learning Disabilities" by S. A. Kirk, P. B. Berry, and G. M. Senf in the Journal of Learning Disabilities, 1979, 12, 239-245.

**Item numbers correspond to those on the PCD, SW, Psych and S/L questionnaires, numbers differ on the principal's questionnaire.

Table 3.2 (continued)

Questionnaire Responses to Key Definitional Questions
From PCD TEachers, Social Workers, School Psychologists,
Speech/Language Specialists, and Principals

		Strongly Agree	1	2	3	4	5	Strongly Disagree
38.	A "non-categorical" category should be created to meet the needs of children with mild handicaps who cannot be identified by the standard definition of PCD.	PCD	27%	32%	20%	12%	8%	
		SW	35%	30%	11%	17%	6%	
		Psych	41%	21%	13%	13%	7%	
		S/L	30%	31%	15%	12%	10%	
8.	The most important evidence that a child is PCD is that he is unable to function in the regular classroom.	PCD	2%	28%	12%	49%	8%	
		SW	1%	13%	11%	51%	24%	
		Psych	3%	18%	15%	45%	18%	
		S/L	5%	24%	13%	41%	17%	
		Prin.	7%	25%	13%	43%	11%	

each factor according to the following scale:

1 = Among the most critical factors. Its presence would cause me to believe that the child was PCD (positive indicator).

2 = Important factor. Its presence would cause me to suspect that the child was PCD (positive indicator).

3 = Not an important factor. Its presence leads me neither to believe or not believe that the child is PCD.

4 = Important factor. The presence of this characteristic would lead me to suspect that the child was not PCD (negative indicator).

5 = Among the most critical factors. Its presence would cause me to believe that the child was not PCD (negative indicator).

Thus positive indicators were those that lend support to the conclusion that a child is PCD, negative indicators would contradict such a conclusion. Clinicians would rarely base their diagnosis of PCD on a single indicator. Factors which were rated as "critical" are those which are very strong signs of the disorder (or against it for critical negative indicators). It might only take one, two, or three of these critical factors to conclude that a child is or is not PCD. "Important" indicators contribute to the diagnosis of PCD (or not PCD) but are not as interpretable in isolation.

In Table 3.3 separate factors are groups in clusters derived from the factor analysis and the percentage responses from one representative question are reported. These results and the responses to key definitional questions in Table 3.2 are summarized below by comparing professionals' opinions to requirements in the legal definitions. Two other important clusters of items, "correlates of PCD" and "providing help to children in need" are discussed.

Ability/Achievement Discrepancy. Ninety-three percent of PCD teachers and similar percents of other professional groups said that an ability/achievement (Table 3.3, #1) discrepancy was an important indicator of PCD.

Table 3.3

Professionals' Ratings of Factors Affecting Determination of a Perceptual Communicative Disorder

The questionnaire responses were factor analyzed to identify important groupings of factors. The groupings are shown below. Responses are reported for a key question in each set of factors.

		Among most critical/positive indicator	Important/ Positive	Not an important factor either positive or negative	Important/ Negative	Among most critical/negative incicator
1. Achievement/ability discrepancy	PCD	46%	47%	4%	2%	
	SW	33%	58%	6%	2%	
	Psych	31%	62%	6%		
	S/L	51%	43%	4%	1%	
2. Lack of other support in the environment 3. Inadequacy of teacher 4. Socio-economic disadvantage 5. Cultural deprivation 6. Linguistic differences	PCD	6%	18%	40%	29%	4%
	SW	2%	15%	51%	25%	5%
	Psych	1%	11%	45%	38%	3%
	S/L	1%	17%	47%	27%	5%
7. Lack of motor coordination 8. Distractibility 9. Short attention span	PCD	11%	78%	9%	2%	
	SW	11%	65%	18%	3%	2%
	Psych	12%	78%	7%	1%	
	S/L	13%	75%	10%	1%	

Table 3.3
(continued)

Professionals' Ratings of Factors Affecting Determination of a Perceptual Communicative Disorder

		Among most critical/positive indicator	Important/Positive	Not an important factor either positive or negative	Important/Negative	Among most critical/negative indicator
10. Good social skills						
11. Generally good physical health status	PCD		13%	77%	6%	3%
	SW	1%	12%	76%	9%	1%
	Psych	2%	15%	74%	7%	1%
	S/L	1%	11%	76%	7%	2%
12. Premature birth						
13. Aggressiveness	PCD	1%	30%	60%	5%	2%
	SW	3%	24%	65%	7%	
	Psych	2%	25%	61%	11%	
	S/L	1%	26%	60%	10%	1%
14. Minority group membership						
15. Student is a girl	PCD			83%	5%	12%
	SW	1%	3%	78%	6%	11%
	Psych		2%	87%	8%	3%
	S/L		8%	82%	7%	9%
16. Physiological-neurological inequalities						
17. Psychological process deficits	PCD	17%	56%	11%	11%	
	SW	15%	51%	19%	9%	
	Psych	37%	52%	5%	3%	1%
	S/L	29%	53%	7%	4%	
18. Verbal/performance discrepancy						
19. Inadequate speech/language functioning	PCD	31%	54%	12%	1%	
	SW	11%	66%	18%	2%	
	Psych	18%	64%	14%	2%	
	S/L	18%	68%	10%	2%	

Processing Disorder. Seventy-three percent of PCD teachers said that psychological process deficits are important indicators of PCD (Table 3.3, #17). Some professionals do not use this as an indicator. It is difficult to interpret why 10% of psychologists and PCD teachers said it was a negative indicator, i.e., should recommend against PCD placement.

Exclusionary Factors. For the first two definitional components, the opinions of professionals tended to be congruent with the legal defintions of PCD. For the exclusionary Clause in both the federal and Colorado definitions, this was not the case. For example, in Table 3.3 (#6) from 12% to 24% of professionals said that linguistic differences were a positive indicator for PCD rather than a negative indicator, or reason for exclusion. Responses to this question paralleled those for the cultural-deprivation and socio-economic-disadvantage factors. The exclusionary clause in the PCD definition says that children with these characteristics should not be considered PCD if these other factors are the source of their learning problems. About 35% of professionals have adopted this reasoning, a large number are neutral, and a non-negligible group would use these as signs for the disorder rather than against it.

The same pattern holds for the "exclusionary" questions (#9 and #10) in Table 3.2. If a child has a history of excessive absences or is dominant in a language other than English, the exclusion component of the definition would suggest that they not be identified as PCD since these other causes probably explain their achievement deficit. A majority of professionals agreed with this reasoning. However, a substantial number, on the order of 20-25%, disagreed or strongly disagreed.

Correlates of PCD. Short attention span, distractibility, lack of motor coordination, other health problems, and agressiveness (Table 3.3, #9, 8, 7, 11, 13) are characteristics that are frequently observed concomitantly with PCD but are not part of the definition of PCD. Professionals tended to consider these as neutral or slightly positive indicators (presumably to be interpreted in the context of a set of other indicators). A group of about 10% of professionals would consider short attention and general poor health as strong, critical indicators of PCD.

Providing Help to Children in Need. A majority of professionals (60%) agreed with the statement that a "non-categorical" category should be created to meet the needs of children with mild handicaps who cannot be identified by the standard defintion of PCD.

Summary of Professionals Opinions Regarding the Definition of PCD. More than anything else, the results of the factor analysis of definitional questions, revealed the complexity of the issues and the diversity of professional opinions. A large majority of professionals involved in the identification of PCD children subscribed to the discrepancy and processing deficit components in the definition of PCD. When examples were present from the exclusionary clause of the definition, e.g., linguistically different children should not be identified as PCD, some professionals agreed, many were neutral, and from 12-24% would consider this as supporting evidence for the determination of a PCD handicap.

Chapter Summary. The Colorado definition of perceptual and communicative disorders is virtually synonymous with the federal definition of specific learning disabilities. Although the meaning of perceptual handicaps in the literature is not always equivalent to learning disabilities, the combination of perceptual and communicative dysfunctions in the Colorado category and the lack of any explicit distinctions between the definitions make them essentially the same.

The key elements which define PCD and specific learning disabilities are: a significant discrepancy between ability and actual achievement, attribution of the cause of the discrepancy to a processing disorder, and exclusion of (i.e., ruling out of PCD) other causes for poor school achievement, such as mental retardation, visual or auditory handicaps, emotional disorders, or lack of opportunity to learn.

Sample criteria for determining PCD were circulated by CDE in the sample Comprehensive Plan. These de facto guidelines are believed to have the force of law in more than half of the districts and BOCS. Unlike the federal and Colorado, state-of-the-art definitions, these criteria have serious problems including the use of age-norms to identify processing deficits, introducing the concept of absolute as well as relative deficit without providing a rationale, and giving carte blanche to professional judgment without imposing any standard for consistency.

Professionals who participate in the identification of PCD children differ in the extent to which their own views match the legal definition of PCD. There is the most disagreement about whether children who are linguistically different or come from a low socio-economic environment should be generally included in PCD because of this factor or excluded because of it.

4

PREVALENCE

In 1979-80, 26,387 PCD pupils were served in the public schools of Colorado. These pupils represent about 5% (5.1%) of the pupils enrolled in school.* The data in Table 4.1 show an increase in both the number and percentage of PCD pupils from 1973-74 to the present. The increase was greatest in the first two years when children with this disorder were first being identified. Subsequently the increase was about .2% of total enrollment per year until the recent increment of .4%.

The increase in the PCD population is probably not primarily due to in-migration or changes in the demographic characteristics of the state. If such were the case, the resultant changes in the state's socio-economic make-up would have increased several other categories of handicap. This has not happened. Instead the trend in Table 4.1 shows that PCD is growing more rapidly than other handicapping categories, i.e. PCD pupils are an increasingly larger percent of all handicapped pupils. Of all handicapped children in the state of Colorado in 1979-80 those with PCD constituted 47%.

The data in Table 4.2 are national statistics reported by the U.S. Department of Education for the 1979-80 school year. The percentage of school-aged children served in each handicapping condition under Public Law 94-142 is reported for each state and for the nation as a whole. Note that the percentage of learning disabled children reported for Colorado, 3.5%, is different from the percent given in Table 4.1 for the same year (5.1%). This occurred because the percents are based on different counts and different base rates. Colorado's count includes PCD children served any time during the year, the federal count is taken in December and is not cumulative. The Colorado base is children enrolled, the federal government used the numbers of school-aged children reported in the census.

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*Percents are based on Average Daily Attendance Entitlement (ADEA)

TABLE 4.1

NUMBER AND PERCENTAGE OF PCD PUPILS SERVED IN COLORADO 1973-74 to 1979-80

Year	Number of PCD Pupils Served	PCD Pupils as a % of ADEA*	PCD Pupils as a % of all Handicapped Pupils
1973-74	11,426	2.1%	22.4%
1974-75	14,048	2.6%	27.8%
1975-76	22,246	4.2%	36.7%
1976-77	22,707	4.3%	39.5%
1977-78	23,382	4.5%	43.8%
1978-79	24,451	4.7%	45.1%
1979-80	26,387	5.1%	46.7%

* Average Daily Attendance Entitlement (ADAE)

TABLE 4.2

PERCENTAGE OF SCHOOL-AGED CHILDREN SERVED BY HANDICAPPING CONDITION UNDER P.L. 94-142, SCHOOL YEAR 1979-80*

State	Mentally Retarded	Hard of Hearing	Deaf	Speech Impaired	Visually Handicapped	Emotionally Disturbed	Orthopedic Impaired	Other health Impairments	Learning Disabled	Deaf-Blind	Multi-Handicapped	Total
Alabama	4.07	.05	.02	1.64	.03	.38	.04	.06	1.82	.00	.13	8.30
Alaska	.56	.08	.01	2.12	.03	.26	.11	.04	4.40	.00	.02	7.69
Arizona	1.24	.10	.00	2.12	.04	.82	.13	.11	4.21	.00	.09	8.89
Arkansas	2.91	.06	.00	2.33	.01	.08	.03	.04	2.73	.00	.05	8.30
California	.79	.06	.07	2.31	.05	.59	.32	.75	2.52	.00	.00	7.50
Colorado	.78	.13	.00	1.77	.03	1.05	.10	.00	3.50	.00	.09	7.49
Connecticut	1.09	.07	.05	2.14	.00	1.63	.08	.14	3.67	.00	.00	8.90
Delaware	1.33	.02	.00	1.32	.00	1.74	.00	.00	4.71	.00	.00	9.15
District of Columbia	.04	.02	.00	1.12	.01	.01	.06	.10	.12	.00	.01	1.53
Florida	1.49	.00	.08	2.47	.04	.62	.10	.00	2.87	.00	.08	7.79
Georgia	2.48	.07	.04	2.00	.05	1.12	.04	.12	2.29	.00	.14	8.40
Hawaii	.86	.06	.03	.60	.01	.13	.01	.00	3.46	.00	.06	5.25
Idaho	1.46	.08	.04	2.06	.04	.25	.23	.28	3.89	.00	.25	8.63
Illinois	1.56	.06	.02	3.10	.04	.90	.06	.07	2.82	.00	.07	8.75
Indiana	1.87	.05	.01	3.85	.02	.12	.05	.02	1.40	.00	.05	7.48
Iowa	1.95	.10	.01	2.49	.03	.48	.10	.00	3.72	.00	.10	9.02
Kansas	1.52	.09	.00	2.60	.03	.43	.05	.13	2.54	.00	.05	7.49
Kentucky	2.78	.07	.00	2.91	.03	.30	.07	.12	1.80	.02	.06	8.21
Louisiana	1.80	.04	.03	2.54	.04	.46	.05	.15	2.95	.00	.08	8.20
Maine	1.82	.09	.03	2.24	.04	1.33	.13	.06	3.07	.00	.34	9.20
Maryland	1.10	.11	.04	2.62	.04	.31	.08	.19	4.94	.00	.20	9.67
Massachusetts	1.96	.41	.06	2.98	.08	1.75	.02	.41	2.57	.02	.02	10.30
Michigan	.97	.09	.04	2.51	.04	.79	.19	.00	2.02	.00	.00	6.69
Minnesota	1.56	.13	.03	2.55	.04	.42	.13	.18	3.86	.00	.00	8.93
Mississippi	3.02	.04	.00	2.35	.01	.03	.04	.00	1.36	.00	.01	6.89
Missouri	1.95	.05	.03	3.20	.02	.56	.06	.10	2.93	.00	.15	9.10
Montana	.91	.07	.00	2.17	.02	.23	.07	.06	2.94	.00	.35	6.87
Nebraska	1.97	.09	.00	3.07	.03	.38	.13	.00	2.90	.00	.09	8.70
Nevada	.81	.05	.07	2.04	.04	.15	.16	.12	3.62	.00	.18	7.30
New Hampshire	.64	.04	.00	.70	.01	.17	.04	.07	2.83	.00	.00	4.54
New Jersey	.93	.05	.05	3.77	.02	.78	.07	.10	2.82	.00	.21	8.85
New Mexico	1.14	.06	.02	1.37	.01	.54	.05	.00	3.34	.00	.12	6.71
New York	1.05	.04	.02	1.13	.04	1.05	.14	.91	.79	.00	.00	5.21
North Carolina	3.33	.08	.00	2.17	.04	.25	.07	.06	2.74	.00	.06	8.85
North Dakota	1.22	.07	.01	2.18	.03	.15	.05	.03	2.34	.00	.10	6.22
Ohio	2.15	.00	.10	2.70	.03	.16	.14	.00	2.40	.00	.06	7.79
Oklahoma	2.04	.04	.04	3.14	.03	.08	.04	.05	4.11	.00	.10	9.71
Oregon	.68	.08	.03	2.31	.04	.36	.20	.11	3.87	.00	.00	7.72
Pennsylvania	1.72	.12	.02	2.90	.07	.38	.06	.01	1.72	.00	.02	7.06
Rhode Island	.78	.04	.03	1.70	.02	.48	.08	.09	4.32	.00	.02	7.60
South Carolina	3.66	.11	.00	3.06	.06	.69	.12	.01	2.36	.00	.07	10.18
South Dakota	.64	.21	.00	3.11	.01	.17	.04	.01	1.56	.00	.17	5.96
Tennessee	2.37	.17	.03	3.32	.06	.27	.12	.16	2.84	.00	.16	9.55
Texas	.81	.01	.01	2.36	.04	.33	.08	.09	4.15	.00	.60	8.51
Utah	.89	.07	.01	2.41	.04	2.94	.05	.03	3.94	.00	.36	10.79
Vermont	1.35	.12	.05	2.84	.06	.22	.22	.10	3.97	.00	.11	9.09
Virginia	1.63	.06	.03	2.85	.05	.40	.04	.03	2.47	.00	.20	7.79
Washington	1.20	.06	.06	1.40	.03	.65	.09	.13	2.54	.00	.08	6.26
West Virginia	2.76	.04	.01	2.50	.03	.19	.07	.18	2.28	.00	.07	8.18
Wisconsin	1.30	.06	.03	1.47	.02	.68	.07	.04	2.18	.00	.07	5.95
Wyoming	.87	.13	.01	2.50	.02	.60	.07	.06	4.87	.00	.20	9.39
American Somoa	.46	.07	.08	.00	.03	.00	.02	.00	.34	.02	.12	1.19
B. I. A.	1.87	.24	.01	2.01	.09	.65	.08	.06	5.20	.00	.78	11.05
Guam	2.18	.07	.13	.89	.04	.00	.00	.00	.51	.00	.01	3.87
North Marianas	.17	.07	.21	.00	.03	.00	.00	.00	.42	.01	.17	1.12
Puerto Rico	1.14	.04	.11	.13	.17	.20	.07	.09	.38	.01	.18	2.85
Trust Terr.	.04	2.31	.04	.56	.04	.08	.06	.14	.23	.05	.27	4.37
Virgin Islands	2.51	.00	.00	.90	.00	.00	.00	.00	.51	.00	.00	3.93
National Total	1.57	.07	.03	2.41	.04	.60	.11	.20	2.59	.00	.10	7.78

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*Special thanks to Paul Byrne, Office of Special Education and Rehabilitative Services, U.S. Department of Education, for providing these data in advance of publication.

Thus, the data are comparable within each table, but comparisons should not be made between the two tables.

Colorado has a smaller percent of school children in all handicapping conditions combined than does the nation as a whole (7.49% vs. 7.78%). Colorado's percent of learning disabled children is well above the national average (3.5% vs. 2.59%) but not as high as several other western states including Arizona, Texas, Oklahoma, Wyoming, and Utah. Originally, when P.L. 94-142 was passed, it was expected that no more than 2% of the population could be identified as learning disabled. That ceiling was later removed, but the ceiling on all handicapping conditions was placed by the federal government at 12% of the school age population.

Table 4.3 provides a picture of how the percentages of PCD pupils are distributed in the 48 special education units within Colorado. (These data are in the Colorado metric and are comparable to the state data in Table 4.1). The units were rank ordered by 1978-79 PCD percents to disguise the identity of the districts and to highlight the range of percentage of PCD pupils in various Colorado districts, from 1.91% to 8.91% in 1978-79. In 1979-80 the lowest and highest percents were 2.11% to 8.56%, respectively.

There is not a direct correspondence between the percentage of PCD pupils served and the total of handicapped pupils in various districts. However, for the 1979-80 data, the correlation was .78. The units reporting the very largest percents in the PCD category also have proportionally among the largest total special education populations. In the middle range, however, there are both very high and very low total handicapped percents from districts with very similar percents - PCD. In the lower range, there are a few units with a relatively small percent in PCD but relatively larger percentages in other handicapping conditions.

Table 4.3 also includes the ratios of professional staff FTE to PCD pupil headcounts. The total number of PCD pupils reported for a unit in 1978-79 was divided by the number of staff FTE to represent the average number of pupils served by each staff member. The staff FTEs were calculated by summing the fractions of all special education personnel FTEs attributable to direct and indirect service of PCD pupils. These data for each unit are comparable to the overall state ratio, 1/18.6, reported for PCD pupils for 1978-79 in the CDE report (1980), Table XXVII. These figures are juxtaposed to show any relationship that might exist between the percentage of PCD pupils served and staff ratios. One might expect that districts with the largest

TABLE 4.3

DISTRIBUTION OF SPECIAL EDUCATION UNITS IN COLORADO BY PERCENTAGE OF PCD PUPILS PERCENT TOTAL HANDICAPPED AND STAFF FTE/PUPIL RATIO

	PCD Pupils as a % of ADAE		1978-79 Percent Total Special Education	1978-79 Staff FTE/PCD Pupil Headcount
	1978-79	1979-80		
	8.91	7.40	16.36	1/33
	7.54	8.49	14.39	1/13
	7.12	5.23	11.55	1/15
	7.11	7.44	14.24	1/23
	7.04	6.75	13.95	1/13
	6.71	6.88	12.97	1/16
	6.45	7.32	12.53	1/13
	6.43	5.71	13.14	1/23
	6.18	6.33	11.69	1/7
	5.95	6.47	10.35	1/12
	5.82	8.56	12.10	1/12
	5.65	5.09	10.59	1/17
	5.51	4.97	13.14	1/12
	5.35	5.27	9.54	1/16
	5.34	5.04	8.11	1/2
	5.34	5.39	8.47	1/12
	5.21	5.53	9.86	1/17
	5.18	4.12	10.71	1/16
	5.14	3.61	13.15	1/16
	5.06	5.01	17.47	1/13
	4.93	5.27	9.13	1/9
	4.62	4.90	10.93	1/17
	4.60	4.81	11.76	1/21
	4.55	6.80	7.87	1/18
	4.46	5.65	10.21	1/18
	4.44	5.21	9.69	1/12
	4.42	5.02	11.40	1/18
	4.36	4.08	10.73	1/18
	4.35	4.91	9.50	1/17
	4.35	6.13	9.85	1/13
	4.34	4.51	9.43	1/16
	4.26	5.28	11.15	1/16
	4.23	4.40	9.94	1/15
	4.22	3.79	9.02	1/17
	4.16	5.19	9.63	1/13
	4.15	5.26	8.42	1/10
	4.04	4.36	9.90	1/16
	4.00	3.66	10.63	1/9
	3.89	3.94	8.16	1/10
	3.67	4.00	9.42	1/15
	3.65	6.20	7.55	1/14
	3.65	5.09	11.43	1/12
	3.63	4.45	9.15	1/14
	3.56	3.64	8.71	1/11
	3.46	4.16	10.35	1/11
	3.27	3.64	6.94	1/15
	2.78	3.10	7.04	1/12
	1.91	2.11	6.12	1/12
State as a Whole	4.69	5.14	10.40	1/18.6

Table 4.4

Correlations Among District Variables Using CDE Data for 48 Special Education Units and Aggregate Pupil Characteristics for 22 Units in the Representative Sample**

Variables	% EMR	% EB	% PCD	% Speech	Total % Sp. Ed.	ADAE	% Free Lunch	$ Reim.	Staff/Ratio	% IQ/Ach.	% Sign. Discr.	% LD
% EMR*												
% EB*	-.39											
% PCD	-.08	.13										
% Speech	.11	-.02	.32									
% Total Sp. Ed.	.01	.57	.78	.53								
ADAE	.10	.00	-.07	-.20	-.01							
% Free Lunch	.36	-.14	.03	.07	.07	-.05						
$ Reimbursed	.17	.10	-.04	-.19	.04	.97	.00					
Staff FTE/ PCD Headcount	.20	-.34	-.37	-.10	-.37	-.14	.20	-.08				

The following variables were developed to reflect the quality of the evidence of true PC disorder; they are defined in Table 7.1. (The correlations are computed for the 22 units in the study only.)

Variables	% EMR	% EB	% PCD	% Speech	Total % Sp. Ed.	ADAE	% Free Lunch	$ Reim.	Staff/Ratio	% IQ/Ach.	% Sign. Discr.	% LD
% With IQ and Achievement Tests+	.13	.15	-.22	-.01	.03	.41	.20	.46	-.10			
% Sign. Discrep. +	.21	.06	-.17	-.16	-.04	.47	-.07	.50	-.21	.53		
% With at least one signif. sign of LD+	.13	.12	-.01	-.10	.07	.51	-.13	.53	-.13	.42	.79	
% With quality processing deficit+	.03	.30	.13	-.05	.20	.42	.23	.46	-.09	.32	.23	.48

**All correlations are based on 79-80 data except the Staff/Pupil ratio which is from 78-79.

*These %s are of the units' ADAE.

+These %s are a percent of the sampled case files.

percents of PCD pupils could have included more mild cases of the disorder and therefore might be serving them with proportionately less staff. There is a weak relationship of this type summarized by the -.37 correlation reported in Table 4.4. This means that there is a tendency for units which report the biggest percents of PCD to compensate slightly by requesting or receiving fewer staff positions in relation to the number of pupils served.

Other district variables are correlated in Table 4.4. There are small positive correlations between the percent of PCD pupils served and the percents in the Speech and Emotional/Behavioral categories. That is, the units with larger percents PCD also tended to have larger percents Speech and EBD. For the 1978-79 data there was a moderately strong negative correlation between percent PCD and percent EMR. However, this relationship is not apparent in the 1979-80 data. Many have speculated that some EMR pupils may be classified as PCD because the label is less stigmatizing. There is also some feeling that "learning disabilities is a middle class disease." Small positive correlations were found which follow this pattern. The percentage of students in a district receiving federally subsidized "free lunches" is an index of the unit's socio-economic status. The data show that on the average, the more free lunches there were in a district, the greater was the percent EMR. In the 1978-79 data there was a concomitant decrease in the percent PCD.

How often children might be called PCD instead of EMR can actually only be determined by examining individual cases. This is one of the purposes of this study. In Chapter 7 variables are developed to characterize identifiable subgroups in the PCD population and to quantify the strength of evidence for the diagnosis of PCD. As seen in Table 4.4, these variables do not have much correlation with the percentage of PCD children served. This means that the districts with the smallest percentages of PCD do not always have proportionally stronger evidence for the validity of placements. There is a tendency, however, for units that gave both IQ and achievement tests* to high percentages of PCD pupils to have smaller percents of PCD (r = -.22); meaning that better assessment is associated with fewer placements. There are also moderate correlations (.41-.51) indicating that larger districts (large ADAE) tend to have higher percentages of valid PCD placements.

*Pupils only had to have one test of each kind to be counted.

Summary

The percentage of PCD pupils served in Colorado has increased steadily since 1973. In 1979-80 5.1% of children enrolled in public schools were served in PCD programs. Colorado's percent of learning disabled children is above the national average but is not as high as several other western states. Of all handicapped children in Colorado, just less than half are identified as PCD. Colorado special education units vary widely in the percent of their enrollments identified as PCD, from 2.11% to 8.56% in 1979-80. There is a relatively strong relationship between percent PCD and percent in all handicapping conditions. There is some evidence to suggest that districts with the biggest percents in PCD have slightly larger average staff/pupil ratios.

The variability among units and across years in the percents identified as PCD can be interpreted in one of two ways. Either there are true differences in the rates at which the psychological characteristic actually exists between District X and BOCS Y or the differences are due to local policies and practices that systematically and arbitrarily produce varying rates of identification per se (not the characteristic per se). That is, some staffing committees may be overly strict and others overly lax, thus artificially creating this variability.

5

ASSESSMENT OF PCD PUPILS:
TESTS AND TEST INTERPRETATION

This chapter is a summary of findings from both the quantitative study of PCD pupil files and the surveys of professionals regarding their assessment practices. Assessment is a broader term than testing. It includes all of the information gathering activities used by specialists in diagnosing pupils. It involves the use of informal testing and clinical observations as well as standardized tests. The validity of the ultimate placement decision for PCD pupils hinges on the validity of each aspect of assessment; these are discussed separately in the following sections: Tests, Test Interpretations, and Clincial Judgments.

TESTS

Number of Tests

The typical PCD case file has a record of six or seven formal tests administered as part of the initial assessment and staffing. A substantial percent of PCD children have eight, ten or more tests as part of their first assessment. Data for different types of tests are summarized in Tables 5.1 and 5.2. Although these numbers reflect how many tests were used to arrive at the decision that a child is PCD, they are the "tip of the iceberg." It is clear from the files that most children receive several more tests so that the teachers can plan instruction and still more tests to evaluate progress at the end of the year. Three-fourths of the PCD teachers in the survey reported giving additional tests to plan instruction after the placement decision.

Although some pupils are given too many tests, one-quarter of the population have too few tests. Twenty-four percent were placed in PCD without any standardized achievement test data. Even more were missing either an IQ test or an achievement test or had tests without percentile norms or standard deviations, so the data were not adequate for computing IQ-achievement discrepancies.

The results in Table 5.1 have been organized to highlight the injudicious use of poorer quality IQ tests. Justifications for labeling the Peabody, Slosson and Detroit as lesser IQ tests are given in the following section where individual tests are evaluated. These tests have very poor reliability and validity. The data at the bottom of the table show that of the 64% of PCD pupils who took the WISC-R or some other high quality IQ test, half were also given one or two other technically inadequate IQ tests. The usual rationale for giving poorer quality tests is that they are adequate as screening measures. Then, if a problem is indicated, any decision would have to be based on follow-up testing with a better quality instrument. This is not, in fact, the sequence that was frequently observed. Instead, the usual pattern was that the PCD teachers and speech-language specialists gave the Peabody and the Detroit (or Slosson) at the same time that the school psychologist gave the WISC-R. Individual clinical reports almost never acknolwedged the results of other IQ testing done concurrently by other specialists. Staffing minutes and reports rarely included even a sentence regarding the congruence of multiple IQ tests. The redundant testing with additional poor quality IQ tests is wasteful and makes no contribution to the validity of the identification process.

Poor quality IQ tests are given in addition to the WISC-R waste pupil and professional time; poor quality IQ tests given alone could lead to invalid decisions. In addition to the 11% of the PCD children who had no IQ test, 23% of the PCD population were placed on the basis of technically inadequate IQ tests: the Peabody, Slosson, Detroit or McCarthy.

Table 5.1

IQ tests Administered to PCD Pupils as part of their initial assessment and placement in PCD

Number of IQ Tests	Estimated Population
No IQ test	11.1%
1 IQ test	33.0%
2 IQ tests	31.3%
3 IQ tests	21.3%
4 or more IQ tests	3.4%
	100.0

Number of Wechsler Tests Given (WAIS, WISC, WISC-R or WPPSI)

None	36.9%
One	62.7%
Two	.4%
	100.0

Number of Poor Quality IQ Tests (the Peabody, Slosson, Detroit or McCarthy)

Administered to those with a Wechsler or Stanford-Binet		Administered to those without a Wechsler or Stanford-Binet	
None	27%	None	12%
One	20%	One	9%
Two	16%	Two	11%
Three	2%	Three	3%
	64% of all PCD pupils		36% of all PCD pupils

Table 5.2

Other Types of Test (beside IQ) Administered to PCD Pupils as Part of Their Initial Assessment and Placement in PCD

Number of Standardized Achievement Tests	Estimated Population %
None	23.5%
One	31.8%
Two	22.9%
Three	15.1%
Four	5.4%
Five	1.2%
	100.0%

Number of Personality Tests	
None	60.2%
One	22.6%
Two	10.8%
Three	5.2%
Four	1.2%
	100.0%

Number of Perceptual-Processing Tests	
None	21.2%
One	25.4%
Two	26.5%
Three	16.4%
Four	7.8%
Five	2.7%
	100.0%

Number of Speech-Language Tests	
None	49.4%
One	26.4%
Two	14.3%
Three	6.2%
Four	2.1%
Five	1.6%
	100.0%

Number of Behavioral Records Made	Estimated Population %
None	97.6%
One	2.5%
	100.0%

Total Number of Tests Administered	
0 *	5.1%
1-2	9.6%
3-4	17.8%
5-6	20.7%
7-8	15.5%
9-10	14.2%
11-12	9.5%
13-14	5.8%
15-16	1.7%
17-18	.3%
	100.0%

Average number of tests per pupil = 6.6

*In one special education unit it was known that PCD teachers usually gave achievement tests but that these were not available in central files. In other instances we were able to call in these files but did not in this case. These omissions account for .7% of the statewide PCD population.

Typical Battery of Tests

The data in Table 5.3 illustrate how many different tests are used in the assessment of perceptual and communicative disorders. The list would be even longer if the "other achievement tests" and "other perceptual or processing tests," often favorite tests of individual districts, had been listed. The percentages are the percent of PCD pupils who were given each test as part of their initial assessment and staffing. All of the tests from this list which were used for 15% of the cases or more are included in the Typical Battery of Tests.

The other source of "most typical tests" is the survey of PCD teachers, school psychologists, and speech-language specialists who are routinely involved in conducting these assessments. The data in Table 5.4 are a summary from a much longer list, indicating which tests each type of specialist administers most often. Also reported are the professionals' opinions about the reliability and validity of their favorite tests. We do not discuss these data because professionals' feelings are not always consistent with technical evidence regarding the adequacy of tests. Quite naturally, specialists generally give high ratings to the tests they use the most. Occasionally they report using a test often but do not believe it has adequate reliablity and validity.

In all, eighteen tests were identified as those most typically used to diagnose PC disorders. The tests are listed later in Table 5.6. The types of specialists who use each test frequently are noted. Also in the table are the letter grades assigned to each test which reflect its quality. The grades are based on the psychometric evidence supporting each test. An explanation of the grades is given in the following section.

Reliability

The psychometric properties of a test that determine its technical adequacy are reliability and validity. Reliability refers to the stability or dependability of test scores. If the test is susceptible to sources

Table 5.3

Percents of PCD Pupils who were Administered Various Tests as part of their Initial Assessment and Placement in PCD

Intelligence Tests

Detroit Tests of Learning Aptitude	38.1%
McCarthy Scales of Children's Abilities	1.8%
Peabody Picture Vocabulary Test	45.1%
twice	1.5%
Primary Mental Abilities Test	.1%
Ravens Progressive Matrices	2.2%
Slosson	10.7%
Stanford-Binet	2.0%
WAIS	1.7%
WPPSI	2.4%
WISC	.9%
WISC-R	58.6%
Woodcock-Johnson Psychoeducational Battery	6.1%
other IQ tests	1.9%

Achievement Tests

Brigance Inventory of Basic Skills	3.2%
California Test of Basic Skills (CTBS)	2.2%
Diagnostic Reading Scales	.1%
Durrel Analyses of Reading Difficulty	2.5%
Gates-MacGinitie Reading Tests	.7%
Gates-McKillop Reading Diagnostic Tests	.9%
Gilmore Oral Reading Test	.3%
Goudey Informal Reading Inventory	1.0%
Gray Oral Reading Test	2.0%
Iowa Test of Basic Skills (ITBS)	1.9%
KeyMath Diagnostic Arithmetic Test	15.3%
Metropolitan Achievement Test	.8%
Peabody Individual Achievement Tests	38.8%
Stanford Diagnostic Reading Test	1.4%
Sucher Allred Reading Placement Inventory	6.7%
Wide Range Achievement Test	36.7%
Woodcock Reading Mastery Test	16.0%
locally developed tests	1.7%
textbook mastery tests	.3%
Monroe	1.9%
other achievement tests	16.9%

Behavioral Recordings

Frequency counting or event recording	.4%
Permanent products	1.5%
Peterson-Quay Behavior Problem Checklist	.1%
other behavioral indicators	.7%

Adaptive Behavior Scales

AAMD Adaptive Behavior Scale (School Version)	.2%
Vineland Social Maturity Scale	.1%
other adaptive behavior scales	.6%

Personality Tests

Children's Appreception Test	.3%
Draw-A-Person	26.0%
Kinetic Family Drawing	13.8%
Piers-Harris Self-Concept Scale	1.6%
Rorschach-Inkblot Technique	.7%
School Apperception Test	.2%
Sentence Completion	13.9%
Thematic Apperception Test	2.2%
other personality tests	6.0%

Perceptual and Processing Tests

Beery Developmental Test of Visual-Motor Integration (VMI)	44.8%
twice	1.1%
Bender (Visual-Motor) Gestalt	46.3%
Frostig Developmental Test of Visual Perception	7.8%
Goldman-Fristoe-Woodcock Auditory Skills Battery	1.9%
Goldman-Fristoe-Woodcock Test of Auditory Discrimination (GFW)	7.6%
Hughes Basic Gross Motor Assessment	.5%
Lindamood Auditory Conceptualization Test	6.4%
Memory for Designs Test	.3%
Motor-Free Visual Perception Test	2.0%
Purdue Perceptual-Motor Survey	.8%
Spencer Memory for Sentences Test	8.1%
Wepman Auditory Discrimination Test	27.6%
twice	1.4%
Wepman Auditory Memory Span Test	1.0%
Wepman Auditory Sequencial Memory Test	.8%
other perceptual or processing tests	14.3%

Speech and Language Tests

Arizona Articulation Proficiency Scale	1.0%
Boehm Test of Basic Concepts	4.7%
Carrow Elicited Language Inventory	2.6%
Carrow Tests for Auditory Comprehension of Language	5.1%
Fisher-Logenann Test of Artic. Comp.	.8%
Goldman-Fristoe Test of Articulation	3.0%
Illinois Test of Psycholinguistic Abilities (ITPA)	32.5%
Northwestern Syntax Screening Test	2.8%
Screening Deep Test of Articulation	.5%
Slingerland Screening Test for Identifying Children with Specific Language Disability	6.2%
Templin-Darley Tests of Articulation	3.6%
Utah Test of Language Development	6.0%
Wiig	4.3%
locally developed language test	5.3%
Token Test	5.9%
other speech-language tests	6.0%

Table 5.4

Percents of PCD Teachers, School Psychologists and Speech/Language Specialists Reporting Frequency of Use and Judgments About Reliability and Validity*

Frequency of Use

Reliability & Validity

1=Adequate 2=Inadequate
3=Don't Know

	Never 0%	Rarely 1-15%	Sometimes 16-50%	Often 51-85%	Nearly Always 86-100	Reliability			Validity		
						1	2	3	1	2	3
PCD Teachers											
Detroit Tests of Learning Aptitude	20	16	18	15	16	39	17	15	32	19	18
Peabody Picture Vocabulary Test (PPVT)	19	19	17	13	16	47	14	10	41	15	10
Woodcock-Johnson Psychoeducational Battery	28	3	8	12	35	60	3	9	56	3	8
KeyMath Diagnostic Arithmetic Test	7	10	23	26	21	60	4	7	58	5	8
Peabody Individual Achievement Tests (PIAT)	10	12	13	16	35	40	23	8	38	22	9
Wide Range Achievement Test (WRAT)	16	12	21	15	20	35	24	10	30	25	12
Woodcock Reading Mastery Tests	19	11	15	18	20	49	6	12	45	6	13
Beery Developmental Test of Visual-Motor Integration (VMI)	15	9	15	14	32	49	10	10	46	10	11
School Psychologists											
WISC-R	0	5	9	29	54	89	3	1	85	6	1
Wide Range Achievement Test (WRAT)	20	15	30	16	11	49	20	14	40	30	13
Draw-A-Person (Goodenough-Harris Drawing Test)	8	16	16	23	34	45	31	8	45	30	10
Kinetic Family Drawing	8	18	25	26	15	32	33	12	30	33	13
Sentence Completion	6	20	32	28	11	32	32	20	36	28	18
Beery Developmental Test of Visual-Motor Integration (VMI)	24	21	14	19	14	55	11	14	48	17	14
Bender (Visual-Motor) Gestalt Test	5	11	13	22	48	64	11	8	57	18	7
Speech/Language Specialists											
Detroit Tests of Learning Aptitude	7	15	24	24	21	52	20	6	45	22	10
Peabody Picture Vocabulary Test (PPVT)	2	6	7	21	58	65	13	6	59	14	8
WISC-R	43	2	7	12	19	48	3	11	47	4	10
Spencer Memory for Sentences Test	16	18	20	17	10	29	22	15	27	21	17
Wepman Auditory Discrimination Test (The Wepman)	6	13	29	23	20	39	31	8	34	30	10
Boehm Test of Basic Concepts	8	18	24	29	13	68	5	5	64	6	4
Carrow Tests for Auditory Comprehension of Language	3	7	27	36	23	77	3	3	70	4	5
Goldman-Fristoe Test of Articulation	22	14	17	21	19	63	2	7	57	3	7
Illinois Test of Psycholinguistic Abilities (ITPA)	13	23	25	21	11	47	20	7	39	21	11

*A longer list of tests was included on the original questionnaire (see Appendix C).

Tests are included here if more than 40% of any group said they used it "with more than half of the children they assessed."

of error that alter a child's score depending on time of day or the version of test administered, the test is unreliable and therefore not interpretable. A reliable test will give consistent results. The reliability of a test is usually reported as a correlation coefficient between two administrations of the same test (with the same sample of pupils) or between two parallel forms of the same test. To ensure the accuracy of decisions made about individuals, measurement experts generally require a correlation of .90 or higher (Nunnally, 1967; Ysseldyke, 1979). The lowest value ever recommended is, .85 (Mehrens & Lehmann, 1973). Reliability is a necessary but not sufficient condition for validity. The same attribute must be measured consistently before it can be measured validly.

Validity

A test is valid if it actually measures what it is intended to measure. The evidence required to demonstrate the validity of a test is more complicated than the simple correlation used to establish reliability. Educational and psychological tests often involve a great deal of inference from the tasks represented on the test to the underlying trait they are presumed to reflect. The tests typically used to identify PCD have been reviewed in the professional literature. We use these reviews along with our own assessment to judge the adequacy of tests used in Colorado.

Technical Adequacy of the Typical Battery of Tests

The single best review of the technical quality of tests used in the diagnosis of learning disabilities is found in a monograph by Thurlow and Ysseldyke (1979). Table 5.5 is reproduced from that study. The pluses and minuses indicate whether the measures met minimum criteria for reliability, validity and adequacy of norms. In the left margin, check marks have been added to note tests which we have identified as part of the typical Colorado PCD battery. In this section we elaborate on the Thurlow and Ysseldyke

Table 5.5

Ratings by Thurlow and Ysseldyke of the Technical Adequacy of Devices Used Nationally in Child Service Demonstration Centers[a]

Test	Norms	Reliability	Validity
Beery Developmental Test of Visual-Motor Integration	-	-	-
Bender Visual-Motor Gestalt	-	-	-
Brigance Inventory of Basic Skills	-	-	-
California Test of Basic Skills	*[b]	*	*
Carrow Elicited Language Inventory	-	-	-
Detroit Tests of Learning Aptitude	-	-	-
Gates-McKillop Reading Diagnostic Tests	-	-	-
Gilmore Oral Reading Test	-	-	-
Goldman-Fristoe Test of Articulation	CR[c]	+	+
Illinois Test of Psycholinguistic Abilities	-	-	-
Key Math Diagnostic Arithmetic Test[d]	-	-	-
McCarthy Scales of Children's Abilities	+	+	+
Motor Free Visual Perception	-	-	-
Peabody Individual Achievement Tests[d]	+	+	+
Peabody Picture Vocabulary Test	-	+	+
Piers-Harris Self-Concept Scale	-	-	-
Ruben	*	*	*
Slossen	-	-	-
SRA Achievement	+	-	-
Spache Diagnostic Reading Scales	-	-	-
Stanford Achievement Test	+	+	+
Stanford-Binet	+	-	-
Test for Auditory Comprehension	-	-	-
Utah Test of Language Development	-	-	-
Wepman Auditory Discrimination Test	-	-	-
WAIS	+	+	+
WISC-R[d]	+	+	+
Wide Range Achievement Test[d]	-	+	-
Woodcock-Johnson Psycho-Educational Battery	+	+	+
Woodcock Reading Mastery	+	+	+

[a] + = technically adequate
 - = technically inadequate

[b] Manual not available

[c] Test is criterion-referenced

[d] Devices used by more than half of all responding centers (N=39)

From Thurlow, M.L. & Ysseldyke, J.E. Current assessment and decision-making practices in model programs for the learning disabled (Research Report No. 11). Minneapolis: University of Minnesota, Institute for Research on Learning Disabilities, 1979.

ratings and summarize other sources regarding the adequacy of each test for the purpose of PCD identification.

Detroit Tests of Learning Aptitude. The manual of the Detroit Tests of Learning Aptitude (DTLA) does not provide adequate evidence of reliability and validity (Silverstein, 1978). The authors have the mistaken idea that just because the DTLA distribution agrees with scores on another test at the median and first and third quartiles that validity is established. But, this could occur because they have a normal distribution and because the scores were standardized to have the same mean and standard deviation; it tells nothing about the validity of individual scores. Despite the attractiveness of 19 subtests on a wide range of aptitudes, there is no justification for using a test with so little evidence pertaining to validity. Furthermore, the reliability of the total test is reported for a sample of only 48 children. No data have ever been reported on the reliabilities of the separate subtests. Given the absence of evidence for subtest reliability or discriminant validity, it is unlikely that subtest interpretations could be supported.

Grade: F

Peabody Picture Vocabulary Test. The PPVT is unacceptable for making any sort of placement decisions for individual children. Parallel-form reliability coefficients range from .67 to .84, always below the recommended standard of .90. As Salvia and Ysseldyke (1978) noted, the norms (by which level of performance is interpreted) are inadequate; they are based on a small, non-representative, all-white sample. Most importantly, the PPVT is entirely lacking in validity as a measure of general intelligence. The new version is in fact called a measure of "hearing vocabulary." Yet, the manual has mistakenly provided for the computation of an IQ score and clinicians have reported it as a measure of IQ. Even as a measure of verbal intelligence, the PPVT is limited to vocabulary knowledge. This seems particularly problematic for assessment of potentially learning disabled children since one goal of testing is to distinguish between learning problems which are environmentally induced (e.g., by lack of opportunity to learn vocabulary) and difficulties within the child in processing information and reasoning. This distinction could not be made with the PPVT. Of course, the emphasis on vocabulary knowledge also makes it unacceptable as a measure of intelligence for children from linguistically or culturally different backgrounds.

Grade: F as a measure of intelligence
C as a measure of receptive vocabulary

(Slosson Intelligence Test). The Slosson is not in our battery of typical PCD tests. It was found in 11% of the PCD children's case files. However, there is growing interest in the Slosson because it is a quick and easily administered measure of IQ. Therefore a word about its technical acceptability is called for. Thurlow and Ysseldyke (1979) found it inadequate in all three categories. Although it shares many items from the Stanford Binet and is highly related with the Binet, it does not produce equivalent scores; furthermore the meaning of the scores cannot be established because the norming sample for the Slosson was not from the normal population but was instead a collection of referred cases. The reliability of the test is unknown. The high coefficient reported in the manual was obtained for a "clinical sample" of 200 individuals whose IQ scores averaged 84. Depending on how low the range extends, the correlations could have been exaggerated by extremely low scores. Furthermore the stability was enhanced by giving the tests at the beginning and end of the same interview.

Specialists who believe the Slosson is acceptable as a preliminary or screening measure should remember that this imples that a better test (presumably the WISC-R) would be given before an important placement decision is made. The same unreliability that makes this necessary would also limit the validity of the screening information.

Grade: C

Wechsler Intelligence Scale for Children-Revised (WISC-R). The WISC-R has strong psychometric properties and is the preferred measure of intelligence for children in the age range 6 to 13 years. The manual reports only split-half reliabilities; they are quite high, .96, .93, and .97 for verbal, performance and full-scale IQ respectively. More impressive evidence of reliability is the correlation coefficients on the order of .95 reported between WISC-R and WAIS scores. Although the test manual does a poor job of documenting validity, there are more than one thousand research studies which taken together, provide compelling evidence of construct validity. While individuals have quarrels with certain aspects of the tests, they uniformly acknowledge its deserved stature in the field (Freides, 1972; Freides, 1978; Osborne, 1972; Petrosko, 1975; Tittle, 1975; Whitworth, 1978). In a review of LD tests, Coles (1978) concluded that the WISC-R and Stanford-Binet are the preferred individual IQ measures and are the only tests in the typical LD battery which have strong enough validity to warrant consistent use. The more important problems remaining with the WISC-R include underestimating the potential of individuals from culturally different populations (Mercer, 1973) and theoretical confusion over the mixing of specific and general measures of intelligence (Freides, 1978). Diagnosticians should especially heed the generally agreed upon conclusion that specific subtest profiles are not valid for identifying special learning categories. (Tittle, 1975).

Grade: A

KeyMath. The KeyMath test is a relatively new, criterion-referenced test that is one of the best regarded achievement tests in the field. Thurlow and Ysseldyke (1979), however, gave it all minus ratings. Although KeyMath is a promising test because of its content coverage, it lacks supporting technical evidence (perhaps because the data have not yet been collected). Reliability data are marginal, validity correlations are embarrassingly low. The normative data are limited and are not from a representative sample. We found Because the manual reports neither standard deviations nor percentile ranks, scores could not be converted into standard scores; therefore it was impossible to use KeyMath results to compute discrepancy scores. The criterion-references properties of the test make it especially useful for locating a child's level of functioning in a program of instruction; the lack of essential technical evidence make it of limited use for diagnosing perceptual or communicative disorders.

Grade: A for instructional planning
C for diagnosis of PCD

Peabody Individual Achievement Tests. The PIAT is an individually administered achievement test considered by many special education experts to be an effective competitor to the WRAT discussed below (Bannatyne, 1974; Proger, 1970). It has passable content validity if one keeps in mind that it is a rough screening device and not a comprehensive measure of achievement (Bannatyne, 1974; French, 1972; Lyman, 1971; Proger, 1970). Like the WRAT, the PIAT cannot have much psychometric strength at any one level of achievement because it attempts to cover such a wide range of subject matter knowledge. Lyman (1971) concluded that, "Although there are advantages to having an individual achievement test, this one suffers in comparison to its group competitors. It has less demonstrated validity, lower test-retest reliability coefficients at most levels (though Mathematics and General Information seem reasonably high at most age levels), smaller standardization samples (inevitable, of course, with an individual test), and fewer subtests Much more research is needed before the PIAT can be fully accepted as a valid test" (p. 137).

Thurlow and Ysseldyke gave the PIAT all plusses; perhaps this leaves an overly optimistic impression, especially in the area of reliability. The reliability coefficients for the total test are consistently near .90 (except in Kindergarten; the PIAT should simply not be used below first grade). However, as Salvia and Ysseldyke (1978) noted, "the reliabilities of the PIAT subtests are too low for use in making important educational decisions" (p. 159). It is the subtests that are likely to be used in the diagnosis of PCD since, quite properly, clincians are interested in identifying areas of specific disability. This is a serious drawback which harms the reliability of PIAT interpretations. Nevertheless, because the PIAT has better content validity and normative data we have given it a relatively high grade.

Grade: B

Wide Range Achievement Test (WRAT). The WRAT is an individually administered achievement test. Unlike individually administered intelligence tests, however, which typically have much greater validity than group intelligence tests, the WRAT has dubious merit compared to the half-dozen better known group-administered standardized achievement tests. Merwin (1972) and Thorndike (1972) reported that the WRAT does not have adequate discriminate validity from IQ, (i.e., WRAT and IQ test appear to be measuring the same thing even though one is called achievement and one is called intelligence). It also lacks representative national norms and fails to provide defensible evidence of either content or statistical validity.

The reliability and validity for this test are reduced because it covers so wide a range of achievement levels. By trying to cover subject matter over many years of curriculum, only a few test items actually measure at each child's level of skill. The effect is the same as trying to make accurate assessments with tests that are only four or six questions long.

Grade: C

Woodcock Reading Mastery Test. The Woodcock is a well developed criterion-referenced test with substantial evidence of its content validity. Thurlow and Ysseldyke (1979) rated it all plusses. Reliability claims are based on limited data but suggest that the test is adequate.

Our only complaint with the measure concerns the accuracy of grade equivalent scores and percentile ranks in grades one and two. First-graders who take the test in March (1.7) but earn a score equivalent to 1.0 are said to be at the 1st percentile. On other standardized achievement tests such a grade score would be at approximately the 13th percentile (on the ITBS) or the 11th percentile (CTBS Level B Form S). This has the effect of greatly exaggerating both the seriousness of the deficit and computed discrepancy scores. These are supposedly empirical norms; but we know that a performance of 1.0 from a March first grader is too usual to be at the 1st percentile. We think this anomaly occurs as a result of the Rasch calibrating methods, either because of the smoothing techniques involving several grade levels which create errors in the extremes or because the Rasch model assumption of no guessing is most seriously violated at the lowest grade levels.

Grade: A-

(Misleading grade equivalents for grades 1 and 2)

Draw-A-Person and Kinetic Family Drawing. These tests along with the Goodenough-Harris (Harris, 1963) Draw-A-Man test, Buck's (1948) House-Tree-Person and Machover Draw-A-Person Test (1949) are projective tests. They have been used by psychologists to measure personality, intelligence, emotional adjustment, developmental age, visual perception, and fine-motor coordination. They are simple drawing tasks that are scored subjectively using scoring criteria established by the authors. Although Harris (1963) reported inter-scorer reliabilities in the .90's, test-retest studies, where the child's drawings change as well as the scorers, have revealed much lower reliabilities, ranging from .60 to .86. These stability values are inadequate for making individual decisions. More importantly the validity of such measures has not been established.

Anastasi (1972) reviewed Goodenough Harris Draw a Man test as follows

> "Attempts to utilize children's drawings as a projective technique for the assessment of personality characteristics likewise proved fruitless. Both the specific research with the present drawing test and an analysis of the published literature on children's drawings led Harris to conclude that 'consistent and reliable patterns having diagnostic significance for personality probably cannot be found in children's drawings' and that such drawings 'primarily express cognitive processes' (p. 671)."

Using tests of this sort, a clinician might fail to discriminate emotional disturbance or specific learning disabilities from low general intellectual ability. Regarding the Draw-a-Person Test, Anastasi (1976) reported that Mackover had not provided any evidence to substantiate suggested interpretations. Furthermore, "Validation studies by other investigators have yielded conflicting results, the better controlled studies lending no support to the diagnostic interpretations proposed by Mackover" (p. 575). Although clinicians may still feel that such tests are an important source of data, we cannot give good grades to tests that are valid in the hands of some trained clinicians but not valid for others.

Grade: C for clinical hypothesis formation
D for placement decisions

Sentence Completion. Like the drawing tests discussed above, the sentence completion technique is a projective device. It is intended to elicit more information about a child's true feelings than a more structured test would permit. As is true for other subjectively scored instruments, this technique has lower reliability and validity than more structured tests of intelligence and personality. Anastasi (1976) used an analogy from Cronbach and Gleser (1965) to defend projective methods as clinical tools rather than as psychometrically sound tests. "Bandwidth, or breadth of coverage, is achieved at the cost of lowered fidelity or dependability of information. Objective psychometric tests characteristically yield a narrow band of information at a high level of dependability, in contrast, projective and interview techniques provide a much wider range of information of lower dependability."

Grade: C for clinical hypothesis formation
D for placement decisions

Beery Developmental Test of Visual-Motor Integration.(VMI) The Beery is a copying task; it has reasonable face validity as a test of visual motor functioning. Reliability coefficients are just below the .90 standard, ranging from .80-.87. Thurlow and Ysseldyke (1979) gave it all minuses. The validity evidence in the manual is almost non-existent. The VMI is said to correlate with reading achievement but neither the magnitude of the correlation nor the characteristics of the subjects are described. Salvia and Ysseldyke (1978) summarized as follows: "As is the case with other such tests, the behavior sampling is limited, although the twenty-four items on the VMI certainly provide a larger sample of behavior than is provided by the nine items on the Bender Visual Motor Gestalt Test or the fifteen items on the Memory for Designs Test. The VMI has relatively high reliability in comparison to other measures of perceptual-motor skills. Validity is, however, questionable." (p. 319)

Grade: C

Bender Visual Motor Gestalt Test. The Bender requires that children reproduce nine geometric designs. It is primarily used to assess visual-perceptual and integration abilities. Psychologists also use it to make judgments about a child's personality, social maturity, emotional adjustment and intelligence. The Bender has seriously poor test-retest reliability values, .60-.66. Thurlow and Ysseldyke (1979) give it all minuses. Salvia and Ysseldyke (1978) concluded, "Validity for the BVMGT is currently not clearly established. The authors have not empirically demonstrated that the test measures visual-motor perception or that it discriminates individual cases of brain injury, perceptual handicap or emotional disturbance. The test certainly provides a very limited sample of perceptual-motor behavior, and for this reason if none other, one would have to be extremely cautious in interpreting and using its results." (p. 309)

Grade: D

Spencer Memory For Sentences Test. The Spencer Memory for Sentences Test is comprised of items taken from the 1937 Stanford Binet. It has no published reliability and validity data. The shortness of the test makes it unlikely that it would have acceptable reliability. The normative data for 6 and 12 year olds were collected in two separate dissertation studies and were not from representative samples.

Grade: D

Wepman Auditory Discrimination Test. The Wepman is most often administered by speech-language specialists but is used to make inferences about a child's auditory perceptual functioning. Thurlow and Ysseldyke (1979) found it technically inadequate in all three categories. However, we would give it passing marks on test-retest reliability as would Arter and Jenkins (1979, p. 523). The Auditory Discrimination Test has some face validity as a measure of auditory discrimination except that sometimes the discriminations required seem to be too fine to be relevant to the type of difficulties the child is experiencing in the classroom. The real problem with the Wepman, however, is its lack of demonstrated validity for identifying specific disabilities. Larsen, Rogers, and Sowell (1976) found that it did not distinguish LD from normal children. No effort has been made to see if low scores validly signify a dysfunction in the processing of auditory input; no evidence exists as to the discriminant validity of auditory discrimination from IQ, especially at the lower end of the distribution.

Grade: C

Boehm Test of Basic Concepts. The Boehm Test is an early childhood measure of the acquisition of basic language concepts such as between and next to. The test-retest reliabilities are marginal (Salvia & Ysseldyke, 1978). The norms are inadequate. There is no validity data but the instrument appears to have face validity. The author says there is no need for empirical data if the test is used in a criterion referenced way. This is basically correct; the test is adequate for identifying a child's level of mastery and for planning to teach concepts not yet learned. The test in no way addresses the cause of nonmastery, nor does it provide adequate norms for interpreting how deviant a certain level of performance is. Therefore, the Boehm would not be appropriate for trying to identify a perceptual or communicative disorder.

Grade: B for instructional planning
D for diagnosis of PCD

Carrow Tests for Auditory Comprehension of Language (TACL). The Carrow TACL is one of the best regarded measures of language comprehension (see Hatten, 1978). It has high test-retest reliability coefficients (.92-.94). Validity is reported by showing relationships between TACL scores and age and statistically significant differences between dysphasic children and normal children. These data are not reported in such a way, however, to permit evaluation of error rates, e.g. given two groups of normal and language disordered children what percent would be accurately classified by the test and what percent would be misidentified? It is quite possible for validity correlations (or χ^2's) to be significant and still have unacceptably high misclassification rates. A more serious problem for the validity of the TACL is its high correlation with IQ (.80 reported in the manual with a trainably retarded sample). Later in this chapter we explain the misconceptions which occur when processing (or language) disorders are inferred from tests which lack discriminant validity from IQ. Molina (1978) concluded that the TACL is adequate as a screening device but should not be used for diagnosis.

Grade: C

The Goldman-Fristoe Test of Articulation is a speech test. Its purpose is to evaluate how well children produce language sounds. Although speech-language specialists often administer this test to potentially PCD children, their purpose is to assess the possibility of a speech disorder, not to diagnose learning disabilities. For its intended purpose the Goldman-Fristoe Test of Articulation has excellent reliability and content validity (Salvia & Ysseldyke 1978). We lowered its grade only slightly because it does not have evidence of empirical validity.

Grade: B

Illinois Test of Psycholinguistic Abilities. The ITPA is increasingly being referred to as a language test; it is, however, probably the most frequently used test of underlying processes. It is therefore important not to mince words in saying that it is a bad test which fails to live up to most of the claims made for it. Although it may well be a reasonably reliable and valid measure of the Osgood-Kirk process model (Wiederholt, 1978), neither the model nor the test have been shown to have predictive or diagnostic validity. Newcomer and Hammill (1976) reached this negative conclusion after summarizing the results of 24 studies involving 1,152 concurrent correlations between the ITPA and academic achievement. After controlling for IQ, only one subtest, Grammatic Closure, had a statistically significant (but still modest, .35) correlation with reading achievement. The fact that many studies originally did not control for IQ may explain why many clinicians are still enthusiastic about the instrument despite such damaging evidence. Newcomer and Hammill (1976) also concluded on the basis of 25 different studies, that the test lacked diagnostic value because it could not consistently discriminate between good and poor readers.

Lumsden (1978) concluded that the ITPA subtests do not have sufficient reliability for differential diagnosis and, considering the absence of validity evidence, said it should never have been published. Waugh (1975) said it is not a measure of language development at all but rather a measure of general ability or IQ. On the basis of the evidence, Wiederholt (1978) recommended that the ITPA not be used "to diagnose or categorize children as having 'language,' 'psycholinguistic,' or 'learning disability,' problems and/or as a basis for planning remedial programs (p. 582)." Carroll (1972), in addition to pointing out that the test was standardized only with normal children and that even the non-language subtests are prevaded by a verbal factor, especially critized the use of the test with lower-class or ethnically-different populations.

Some continue to argue that the ITPA has clinical utility as a rich source of data. However because the subtest reliabilities are completely inadequate for profile interpretation and because there is no validity evidence supporting the interpretation of subtest scatter, we give the ITPA an exceptionally low grade to call attention to its failings for current uses made of it.

Grade: F

Table 5.6

Evaluation of Typical Tests Administered to PCD Pupils in Colorado as part of their Initial Assessment and Staffing

Tests	Used by more than 40% of:	Grade (indicating technical adequacy)
Intelligence Tests		
Detroit Tests of Learning Aptitude	PCD; S/L	F
Peabody Picture Vocabulary Test	PCD; S/L	F as a measure of intelligence C as a measure of receptive vocabulary
Slosson Intelligence Test		C
WISC-R	PCD; Psych. S/L	A
Achievement Tests		
KeyMath Diagnostic Arithmetic Test	PCD	A for instructional planning C for diagnosis of PCD
Peabody Individual Achievement Tests	PCD	B
Wide Range Achievement Test	PCD; Psych.	C
Woodcock Reading Mastery Tests	PCD	A-
Personality Tests		
Draw-A-Person	Psych.	C for clinical hypothesis formation D for placement decisions
Kinetic Family Drawing	Psych.	
Sentence Completion	Psych.	
Perceptual and Processing Tests		
Beery Developmental Test of Visual-Motor Integration	PCD; Psych.	C
Bender (Visual-Motor) Gestalt Test	Psych.	D
Spencer Memory for Sentences Test	S/L	D
Wepman Auditory Discrimination Test	S/L	C
Speech and Language Tests		
Boehm Test of Basic Concepts	S/L	B for instrucional planning D for diagnosis of PCD
Carrow Tests for Auditory Comprehension of Language	S/L	C
Goldman-Fristoe Test of Articulation	S/L	B
Illinois Test of Psycholinguistic Abilities	S/L	F

Summary, Evaluation of Tests

Many of the tests currently being used to diagnose Perceptual/ Communicative disorders are inadequate. The impoverished state of assessment practices in the learning disabilities area is a widely acknowledged problem (see Coles, 1978; Salvia & Ysseldyke; 1978; Thurlow & Ysseldyke, 1979). The nature of the problem is different, however, depending upon whether one is referring to IQ and achievement measures or to measures of perception and processing skills. In the case of IQ and achievement tests, there are good tests available. In these areas assessments are only likely to be unreliable and invalid when, for example, the Peabody and the WRAT are substituted for the WISC-R and the Woodcock Reading Test. But there are no highly valid and reliable tests for measuring processing disorders. Arter and Jenkins (1979) reviewed an extensive body of research and drew conclusions about the reliability and validity of tests intended to measure underlying learning abilities such as auditory discrimination and memory; the reliability of these tests was not adequate for making important individual decisions. As a consequence the tests lacked sufficient diagnostic or predictive validity. Larsen, Rogers, and Sowell (1976), for example found that tests of perceptual functioning could not distinguish between normal and learning disabled children. Usually the modest correlations between processing tests and achievement disappeared when IQ was partialled out.

An important concomitant problem to inadequate tests is the lack of awareness among some specialists that familiar tests are not valid for making placement decisions. The general pattern in Table 5.4 may be promising; more specialists "voted for" adequate validity on the tests that technical experts also rate highly. There were, however, discouraging findings suggesting that not all clinicians are wary of the failings of bad tests: 46% of the PCD teachers and 55% of the psychologists said the VMI has adequate validity data. Among speech language teachers 47%

believed the WISC-R was valid, but an equal number believed the Detroit to be valid; that is, many cannot tell the difference between one of the best and one of the worst tests available. Thirty-nine percent of the speech-language specialists thought the ITPA was valid showing a rather serious miscommunication between practitioners and testing experts.

TEST INTERPRETATION

Test scores do not speak for themselves in the diagnosis of perceptual and communicative disorders. In the section following this one, the subjective process of interpreting test scores singly and in combination is discussed. In this section more routine procedures which bring meaning to test scores are described.

Statistically Significant Discrepancies Between Ability and Achievement

A significant discrepancy between ability and achievement is the primary identifier of specific learning disabilities in the federal definition and is central to the Colorado definition of PCD. It is operationalized by administering an IQ and an achievement test and determining whether a child's level of achievement is significantly below what one would expect based on his ability. Because even the best IQ and achievement tests have measurement error, there will generally be some difference in level of performance on the two tests, just by chance. How much of a difference in the two scores is likely to occur by chance depends on the reliability of each of the tests separately and the correlation between the two tests (see Salvia & Ysseldyke, 1978; Thorndike & Hagen, 1977). The error in interpreting a difference score between two measures will be some combination of the errors in each of them. Formulae for computing the reliability of the difference and the standard error of the difference are given in Appendix B. To interpret the strength of a discrepancy properly--whether it is large enough to be reliable (exceed chance)--requires clinicians to compute the numeric value of the difference, then either construct confidence intervals for the IQ score or do a statistical significance test of the obtained difference.*

Actual computations of significant differences are necessary since it is not always possible to judge intuitively the importance of a discrepancy; it will vary with the reliability of the tests. The data in Table 5.7 are evidence that clinicians' instincts may not always be accurate in discerning a true or reliable discrepancy. Professionals were asked how low an achievement score would have to be to be significantly discrepant from an IQ score of 90. Since a 90 IQ is at the 25th percentile, only option D, achievement at the 12th percentile or lower, could be correct. Half of the PCD teachers knew this, half of them did not.** A greater percent of psychologists knew the correct answer. Most of the speech and language specialists did not have a sense of the actual percentile level for an IQ of 90. The magnitude of a significant discrepancy is difficult to judge because without the computations one has no experience with how big a difference could frequently be created by unreliability in the tests.

Interpreting Subtest Scatter

Because perceptual or communicative disorders are believed to be specific disabilities in an otherwise able child, specialists will often look for perturbations in test performance as a sign of the disorder. When a child exhibits very different abilities on different types of task within a test, the subtest scores are said to have significant "scatter." If a child's level of performance is uniform across various subtests, the result is called a "flat profile."

For subtest scatter to be a valid indicator of PCD, at a minimum the apparent variability in abilities must be reliable (be greater than chance). If the child's strengths and weaknesses shifted from one testing to the

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* Because the standard errors of the difference have a normal sampling distribution, significance at the $\alpha = .05$ level is equal to 1.96 times the standard error of the difference.

**This was an easy question since only one answer was obviously far enough below the level of the IQ score to be significant; a tougher question would have asked for the significant discrepancy among several lower scores.

Table 5.7

Percents of Professionals Selecting Various Cut-Offs on a Specific Question about a Significant Discrepancy

28. If a third grade child had a WISC-R IQ score of 90, in your opinion, how low should his or her reading grade equivalent score be (in October) to be a significant discrepancy?

A. 2.7 (35th percentile) or lower
B. 2.5 (28th percentile) or lower
C. 2.2 (21st percentile) or lower
*D. 2.0 (12th percentile) or lower

PCD Teachers

Option	A	3.8%
	B	9.0%
	C	25.5%
	D	51.1%
	Blank	10.6%

School Psychologists

Option	A	.5%
	B	8.5%
	C	23.6%
	D	54.4%
	Blank	13.0%

Speech/Language Specialists

Option	A	4.9%
	B	9.7%
	C	30.6%
	D	35.1%
	Blank	19.7%

*correct answer

next, it might suggest poor effort or attention during the tests but not an enduring pattern of abilities and disabilities. In the previous section, tests such as the ITPA and Detroit were given low ratings because the reliabilities of the separate subtests are not adequate for the types of profile interpretation usually made. Even on tests with generally better subtest reliabilities, such as the WISC-R, the amount of fluctuation required in the profile, before the differences could be considered reliable, is quite large. Salvia and Ysseldyke provided an example of a WISC-R profile that appears to be irregular but which only has one statistically reliable, deviant subtest score.

For scatter to have validity as an indicator of PCD, it has to be consistently found in known PCD children and not found in normal children. Salvia and Ysseldyke (1978, p. 410) cited this as the difficulty with trying to use scatter as a diagnostic tool; that is, it appears too often in normals. Although there may be a weak relationship between scatter and clinically identified groups, the relationship is not sufficient for making individual diagnoses. They quoted Cronbach (1960): "This type of analysis is no longer depended upon because empirical checks show that pattern analysis has little validity" (p. 192).

Clinicians who work only with "at-risk" children in the population may not have the opportunity to build up experience with the amount of scatter typically found in average and normal children. Kaufman (1976a, 1976b) used the standardization sample from the WISC-R to construct "norms" for interpreting subtest differences. The results are surprising since the amount of difference that is "usual" seems counter intuitive. Using a criterion of 15% in the standardization sample as a cut-off for abnormal occurrences, Kaufman (1976a) concluded that, "...a 10-test range of 6 to 15 or 3 to 12 would not be considered unusual" (p. 36). Clinicians frequently cite a range of this amount as evidence supporting a PCD diagnosis, since this variation does meet requirements for reliability. However, reliability is only a prerequiste for validity, it does not ensure validity. If large ranges are normal, they cannot be valid signs of PCD even if they are reliable. Kaufman (1976b) also reported that the minimally reliable difference between WISC-R Verbal and Performance scales, 12 points, is exceeded by one-third of the normal standardization sample. Again, a difference that is large enough to be statistically reliable is not necessarily abnormal.

Using Age-Norms to Evaluate Processing Deficits

Clinicians frequently use age norms (i.e., the median performance level for children of a given age) to determine whether a child has a processing deficit. This is recommended in CDE's sample criteria shown earlier in Table 3.1. For both standardized tests and informal assessments, significant processing deficits are defined by the following criteria:

Ages	Discrepancy
3-8	- 1 year
9-12	- 1½ years
13-21	- 2 years

This method of evaluating processing skills in relation to age-group medians is contradictory to the ability-achievement discrepancy component of the PCD definition. Because intelligence is correlated with information processing abilities, it can be expected that children with low intelligence and correspondingly poor achievement (i.e., no discrepancy) will also have low processing skills. Therefore, if low scores on processing tests are interpreted in relation to age norms rather than in relation to a child's own level of cognitive functioning, it is equivalent to defining PCD as (severe) below average intelligence.

This criticism of the definition of processing deficits in relation to age medians does not imply that low IQ scores preclude interpretaion of a processing disorder. Clinicians are faced with the problem that obtained

IQ scores could be an underestimate of true ability if a processing problem interfere with test performance; this phenomenon would also prevent an ability/achievement discrepancy from being significant. But if this is the hypothesis to be tested, comparison with age norms does not help to resolve whether a child has low general intelligence which is also reflected on the processing tests or a processing disorder which is depressing IQ test performance. The validity of the tests and the validity of the constructs they represent suggest the following approach: children with processing test scores at roughly the same level as their IQ scores (allowing for the unreliability in the tests) should not be identified as having a processing deficit unless there is consistent and statistically stable evidence of a processing dysfunction in a particular area that also coincides with the particular areas of poor performance on the IQ test. Furthermore, given the information in the preceding section regarding the amount of scatter that should be treated as normal, clinicians will have to develop more extreme criteria for interpreting symptoms of pathology. Recent evidence such as the Kaufman studies suggests that clinicians have been interpreting as abnormal patterns of scores and behaviors that are manifest by large segments of the normal population. It is "usual" for a child with low intelligence to have low processing scores and to have considerable scatter within tests. Only a coherently interpretable picture of a particular processing problem should be allowed to refute the conclusion that the child has "normal" below average functioning.

Summary of Test Interpretation Issues

The standards for interpreting significant discrepancies, subtest scatter, and processing deficits follow the same rules that govern the interpretation of single test scores: they must be reliable and valid indicators. Valid identification of a PC disorder must rest on signs which distinguish disabled children from normal learners. Clinicians can easily experience "vertigo" and lose sight of guideposts which mark normal patterns. It is well known for example that regular classroom teachers are accurate in ranking the achievement levels of the pupils within their class but are inaccurate in predicting where the level of their class is in relation to national norms (without giving standardized tests). Teachers' impressions tend to drift so that they believe that what is average for their class is average nationally. It stands to reason that clinicians who do not test large numbers of normal children may lose sight of how often the indicators they see in potentially PCD children also occur with normal children. Many of the signs currently taken as evidence of PCD occur frequently with normal and average learners.

CLINICAL JUDGMENT

Tests are not the only means of assessment. Professionals frequently draw on their intuitions and experience to determine whether a given child has a PC disorder. Known as the professional judgment, clinical judgment or medical model of assessment, this is a process wherein a clinician observes a pattern of symptoms or behaviors of a child and matches that pattern with mental conceptions and ideas of an underlying trait or disease. The clinician hypothesizes that the child has that particular disease, then goes on to look for other confirming or disconfirming symptomatic evidence. By this rationale, many signs or test scores that would be unreliable and insufficient in themselves to produce valid diagnoses, may be combined to produce valid diagnoses.

Many Colorado specialists claimed to believe in and use clinical judgment in the identification of PCD. The data in Table 5.8 are the opinions of specialists about the use of clinical judgment. To item 36, "Test results should be clearly secondary to clinical judgments in arriving at PCD diagnosis," between 28% and 44% of the specialist groups agreed. It is reasonable to assume that a larger percentage would support a statement which made test results and clinical judgments equal in importance for making diagnoses.

Table 5.8

Professional Opinions About the Use of Clinical Judgment in the Identification of PCD

		Strongly Agree 1	2	3	4	5 Strongly Disagree
*35. It is possible to make valid diagnoses of PC disorders from invalid tests if they are only used as stimuli to test clinical hypotheses.	PCD	5%	25%	33%	21%	13%
	SW	1%	8%	21%	45%	22%
	Psych.	7%	37%	24%	15%	11%
	S/L	5%	36%	30%	17%	11%
36. Tests results should be clearly secondary to clinical judgments in arriving at a PCD diagnosis.	PCD	11%	30%	28%	25%	4%
	SW	5%	23%	26%	33%	10%
	Psych.	16%	25%	23%	25%	7%
	S/L	8%	36%	29%	22%	4%
37. If you agree or strongly agree, describe what steps should be taken by professionals to ensure the validity of clinical judgments.						

Written responses were read twice; the following categories of responses were identified:

- clarify the definition - "How can you diagnose what you can't define?"
- using judgment to temper interpretations of tests - "Some are better tests takers than others"
- need valid tests or valid use of tests - "use more than one test to ensure validity before the clinical judgments"
- gather information that can't be gotten from tests**
  - "check functional level in classroom"
  - "analysis of errors, observe patterns in errors, diagnosis of learning style
  - "writing samples, work behaviors, teacher anecdotes, parental anecdotes"
  - "experience of evaluator; checklist of observable behaviors, information corroborated by home"
- several sources of data - "checking out judgments on three occasions
- concurring opinions of specialists - "confirmation by other judges"
  - "confirmation by other judges"
  - "if the case is valid, clinical judgments and valid test scores should support each other"
- more training or more e)erienced clinicians - "keeping up with research experience"

* Item numbers correspond to PCD teachers' questionnaire

** The majority of answers were in this category.

Use of clinical judgment is sanctioned by the CDE suggested guidelines:

> In the event that the staffing team members all agree that a child has a perceptual or communicative disorder, but a severe discrepancy between achievement and intellectual ability is not indicated, the staffing team may determine that the student has a perceptual or communicative disorder provided that, in addition to the staffing team report, each staffing teach member states in writing:
>
> (a) The specific factors presented in the evaluation which leads the staffing member to the conclusion that the student had a perceptual or communicative disorder.
>
> (b) The extent of the deviation of academic achievement (in one or more of the areas of reading, reading comprehension, written/oral language or math) from the severe discrepancy level established in II-B. (CDE Sample Comprehensive Plan, see Table 3.1)

When used correctly, as a means for generating hypotheses that may then be confirmed or disconfirmed,* clinical judgment may be an appropriate method of PCD diagnosis. However, it has many critics. Meehl (1954) found it to be less adequate than statistical methods of diagnosis. Mercer (1979) argued that its validity must be judged "by the extent to which it predicts pathology" (p. 96). That is, there must be an established empirical correlation between the symptoms and the presence of the disease or trait. Goldberg (1968) found evidence that the accuracy of clinical judgment was unrelated to the amount of training and experience of the clinicians or to the amount and quality of information at their disposal. Clinical judgments are apt to be overly influenced by first impressions (Poulton, 1968) and by information which is readily available but not necessarily reliable (Tversky and Kahneman, 1974; Kahneman and Tversky, 1973). Information that conflicts with a previously held hypothesis tends to be ignored (Wason, 1968). Clinicians overlook the normal variability of traits and behaviors, fail to understand randomness, over-interpret small correlations, and mistake correlations for causes (Smedslund, 1963; Tversky and Kahneman, 1974, Peterson and Beach, 1967).

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* Qualitative analysis of PCD case files revealed that contradictory evidence was rarely acknoweldged or reconciled. Only 10% of the specialists surveyed gave any indication of the proper definition for and role of clinical judgement. Most considered clinical judgment to be synonymous with informal assessment and observation (see Table 5.8, #37).

Clinical judgment is frequently cited as an alternative to tests in the assessment of PCD. As it is currently employed however, faith in clinical judgment may be misplaced.

Summary

The current investment in PCD assessment is enormous and unwarranted in the light of the poor psychometric properties of most tests commonly used. There was multiple and excessive testing of some PCD children while more than one-third of the PCD pupils had not had even one valid IQ test. Although highly valid and reliable achievement tests are available, they are used less frequently than those other tests that are rated in the professional literature as technically inadequate. Measures of various processing abilities are consistently judged inadequate in the professional literature, yet many professionals not only use them in PCD identification but erroneously believe the tests to be adequate.

Unreliable tests, inappropriate use of subtest based diagnosis, and unconfirmed hypotheses generated by clinical judgment all contribute to misidentification of PCD in Colorado pupils.

6

STAFFING PROCESS

The staffing process comprises four distinct phases: referral, assessment, conference, and placement. Many children who are referred as potentially handicapped do not go through the later phases of the staffing process. For example, a child may be referred, but the psychologist who works in his school may suggest some techniques the regular classroom teacher can use to correct the problem that caused the referral. If these are effective, no further evaluation is done; and the problem is solved without the further involvement of special education.

According to CDE data (1980) 42,195 pupils were referred for the Special Education staffing process during the academic year 1978-79 (the last year for which these data were available). Of this number, 78 percent (32,792) were assessed. Of those assessed, 80 percent (26,088) were staffed. Of those staffed, 83 percent were placed and received services. Thus, slightly more than half of those originally referred were eventually placed. One can speculate that one or two things happened to the remainder: either their problems were alleviated or improved spontaneously before the next phase in the staffing process took place; or they were judged (by preliminary assessments or in mini-staffing) to be ineligible for services. These figures represent all handicapping conditions, not just PCD.

Referral. For any child to be considered for special education services, someone must recognize his problem and bring it to official attention, thereby initiating the staffing process. According to the analysis of PCD case files, the person most likely to make that referral was the classroom teacher. Seventy-six percent of the PCD cases (on which referral data were available) were thus referred. The child was referred by his parent in 8 percent of the cases. No other source of referrals accounted for more than 5 percent of the cases.

Assessment. How the characteristics and needs of referred children are to be assessed is regulated by federal and state law. These rules and regulations set minimum standards. Local districts specify additional procedures; individual schools elaborate on them further.

Federal guidelines are as follows:

> State and local educational agencies shall insure, at a minimum, that: (a) Tests and other evaluation materials: (1) Are provided and administered in the child's native language or other mode of communication, unless it is clearly not feasible to do so; (2) Have been validated for the specific purpose for which they are used; and (3) Are administered by trained personnel in conformance with the instructions provided by their producer; (b) Tests and other evaluation materials include those tailored to assess specific areas of educational need and not merely those which are designed to provide a single general intelligence quotient; (c) Tests are selected and administered so as best to insure that when a test is administered to a child with impaired sensory, manual, or speaking skills, the test results accurately reflect the child's aptitude or achievement level or whatever other factors the test purports to measure, rather than reflecting the child's impaired sensory, manual, or speaking skills (except where those skills are the factors which the test purports to measure); (d) No single procedure is used as the sole criterion for determining an appropriate educational program for a child; and (e) The evaluation is made by a multi-disciplinary team or group of persons, including at least one teacher or other specialist with knowledge in the area of suspected disability; (f) The child is assessed in all areas related to the suspected disability, including, where appropriate, health, vision, hearing, social and emotional status, general intelligence, academic performance, communicative status, and motor abilities (USOE, 1977, 42496-97).

The state regulations are congruent with the federal. They require the following:

> Assessment procedures must protect the interests of the child.
>
> Administrative unit personnel evaluating student for any special education program or service must be certificated, endorsed, or otherwise approved by the Department of Education.
>
> The evaluation instruments used for assessment of a child must be selected to minimize any type of cultural or ethnic bias.
>
> Children shall be assessed in the appropriate language and/or through the use of non-verbal techniques. Children who cannot read, write, speak or understand the English language as determined through appropriate testing may not be assigned to special education programs on the basis of criteria developed solely upon the command of the English language.
>
> Each administrative unit shall be responsible for determining policies that describe the general nature of the assessment procedures to be followed by its staff, including the selection of instruments.

> An appropriately qualified professional shall complete the assessment procedures appropriate to the suspected handicapping condition, as indicated below, in sufficient scope and intensity to determine the level of the child's handicap, if any, and to identify the nature of the child's special educational needs.

For children suspected of PCD, the assessment must include a vision and hearing screening, educational assessment, developmental history, assessment of speech and language and adaptive behavior. "Recommended" areas of assessment include assessment of health history and status and psychological assessment. Complete hearing and vision assessment are "optional," according to the state guidelines.

A complete account of actual assessment practices is presented in Chapter 5. As Tables 5.1 and 5.2 show, all but 11 percent of the PCD case files had records of intelligence tests given (55 percent exceeded the minimum of one IQ test). All but 24 percent of the PCD cases had records of standardized achievement tests given (45 percent exceeded the minimum of one such test). Forty percent of the cases had records of personality testing. Eighty percent had some kind of perceptual processing test. Fifty percent had some kind of speech-language test. It should be noted that assessment is more than testing. Therefore, the lack of speech language test for half the cases does not reflect the absence of clinical assessment of those functions.

Staffing Conference. The culmination of the PCD identification process is the staffing conference. After the clinicians complete their assessment and school staff decide (in a mini-staffing, perhaps) that the process should continue, a meeting is scheduled. The purpose of the meeting is for the clinicians to present the results of their assessments, to determine whether the child is eligible for services for the handicapped, to determine the child's needs and the program of services that the school will provide. The staffing conference also plays an important role in insuring due process, for the child's parents are thereby informed of their and their child's rights, informed of the child's characteristics and needs as perceived by the clinicians, and given a voice in deciding his program and placement. Parents and professionals jointly write an Individual Educational Plan (IEP) at the end of the staffing conference in the case of children declared handicapped.

The procedures of the staffing conference are determined to a certain extent by state and federal regulations, although local district and school practices may differ.

The federal requirements are as follows:

> (a) In interpreting evaluation data and in making placement decisions, each public agency shall: (1) Draw upon information from a variety of sources, including aptitude and achievement tests, teacher recommendations, physical condition, social or cultural background, and adaptive behavior; (2) Insure that information obtained from all of these sources is documented and carefully considered; (3) Insure that the placement decision is made by a group of persons, including persons knowledgeable about the child, the meaning of the evaluation data, and the placement options; and (4) Insure that the placement decision is made in conformity with the least restrictive environment rules in 121a.-550-121a.554.
> (b) If a determination is made that a child is handicapped and needs special education and related services, an individualized education program must be developed for the child in accordance with 121a.340-121a.349 of Subpart C.

In the administration of the Handicapped Children's Educational Act, the state regulations are as follows:

> The determination that a child is handicapped and the recommendation for placement of that child in a special educational program shall be made by a committee of professionally qualified personnel designated by the governing body of the administrative unit. The decision of the committee shall be reached by consensus among the prescribed members.
>
> The committee shall be composed of the following:
>
> (a) The special education director, or his designee; (b) A school building administrator, or his designee; (c) A classroom teacher or counselor; (d) A special educator; (e) When reduced hearing or visual acuity is indicated in the assessment, a specialist in these areas must also be present; (f) A school psychologist and/or a school social worker; (g) One or more of the following professional personnel shall be included, as governed by the number and kinds of assessment procedures completed in each case, to interpret specialized assessment information which he or she may have obtained about the child, or to provide other pertinent information: a school nurse, a school audiologist, a physical therapist, an occupational therapist, a speech correctionist, other professional personnel who have contributed to the assessment of the child; (h) Where the assessment indicates that consideration should be given to recommending placement of a child in a community center program, the staffing committee shall include representatives of such agency. Parental permission for participation of such representatives shall be required; (i) In no case may any member of a staffing committee function simultaneously as the designee of more than one other member of the committee.

> The functions of the staffing committee, individually and collectively, shall be:
>
> (a) To certify that an assessment of sufficient scope and intensity was completed. In certain speech problems, this may be considered to have been done when the speech correctionist certifies the handicap based on the mandatory assessment suggested in 3.03(5)(a); (b) To provide a professional interpretation of the results of the formal and informal assessments which have been made; (c) To identify the specific education needs, if any, of the child; (d) Based on the preceding steps, to determine whether the child is unable to receive reasonable benefit from ordinary education due to one of the handicapping conditions described in 1.01 of these Rules, and that the child is therefore eligible for placement in a special education program; (e) To identify the characteristics of the special education services which will meet the child's educational needs; (f) To recommend placement in the least restrictive alternative obtainable which most nearly approximates the characteristics of the services identified in 3.04(3)(e); (g) To keep accurate records of minutes of the meetings.
>
> Parents shall be notified, in writing, in a timely manner of the staffing and given the opportunity to consult with the committee and to attend and participate in the staffing. Such notification shall also inform the parents of their right to be represented at such conferences or staffings by counsel, or other representative of their choice.

According to the study of PCD case files, the average number of people at staffing conferences was seven. Table 6.1 shows data on the proportion of cases having different numbers of persons present. For example, 2 percent of the cases had only two or one persons present, less than the minimum number required. On the other extreme, 22 percent had nine or more persons present.

The proportion of cases wherein the professionals submitted written reports is also given in Table 6.1. Thirty-two percent of the staffing conferences of PCD cases had reports written by one or two professionals. Twenty-eight percent had written reports from five or more professionals.

The specific types of individuals participating in staffings are listed in Table 6.2. The great majority of Special Education staffings are in compliance with the law as to the personnel who must be present. The data in Table 6.2 are for all initial PCD staffings irrespective of year. Higher percentages occur in the mandatory categories in more recent years. (Apparent shortfall in participation of required personnel was due to poor record-keeping in some cases rather than actual noncompliance.)

TABLE 6.1

NUMBER OF PROFESSIONALS WHO SUBMITTED WRITTEN REPORTS AND ATTENDED STAFFINGS FOR THE INITIAL PLACEMENT OF PCD PUPILS CURRENTLY IN THE PROGRAM

Number of Professionals	% of PCD Pupils with # Present	% of PCD Pupils with # of Reports Submitted
None (no data)	12%	11%
1-2	2%	33%
3-4	5%	29%
5-6	22%	27%
7-8	38%	1%
9-10	18%	
11-12	3%	
13 and more	1%	
	100%	

Mean number present = 7.26

Mean number present for cases with adequate records = 7.56

Mean number of reports = 3.3

Mean number of reports for cases with adequate records = 3.7

TABLE 6.2

TYPES OF INDIVIDUALS SUBMITTING WRITTEN REPORTS AND ATTENDING STAFFINGS OF PCD PUPILS

Type of Individual	% of PCD Cases with Report Submitted	% of PCD Cases with Attendance at Staffing
Regular Classroom Teacher	7%	58%
Special Education Teacher	66%	76%
Social Worker	48%	54%
School Psychologist	70%	71%
Private Specialist	2%	1%
Physician	1%	0%
Nurse	51%	54%
Principal	0%	58%
Parent	1%	48%
Speech/Lang. Specialist	44%	43%
Chairman	1%	39%
Others	3%	49%

With so many professionals involved in the staffing conference we suspected that parents might feel intimidated, and we asked that question of professionals in our survey. The results are unequivocal, as Table 6.3 shows. Approximately 70 percent answered in the affirmative.

Table 6.4 shows the proportion of staffing conferences at which adequate records were kept of who attended. A rather small percentage of those cases staffed prior to 1975 had adequate records kept of their conferences. This improved over time, but the rate of adequate record-keeping never was greater than half.

The survey of professionals included questions on the length of staffing conferences (excluding time spent on the IEP). The length of the "shortest" staffing conference was estimated to be 27 minutes, and the longest was estimated to be 90 minutes, on the average (see Table 6.5). From these data, one can guess at a range of time from 15 minutes to 2 and three-quarters hours.

According to our survey, half of all staffing time was spent in determining "handicapping condition and placement," and a quarter of the time was spent writing the IEPs or planning instruction. The remainder of staffing time was spent in annual reviews and miscellaneous activities.

The time and amount of professional energy spent in assessment and staffing are considerable. Professionals were asked in our survey about the trade-off in amount of time thus spent and the need to satisfy due process requirements and the need to identify the handicapped children accurately.

Table 6.6 contains the results of these questions. Approximately one-third of all respondents felt that current staffing procedures were about right in both thoroughness and efficiency. Another third believed them to be thorough enough and not wasteful of staff time. One-fifth to one-third, however, found them wasteful of staff time. One-tenth thought that the procedures were not sufficiently thorough. On a related question asked of school principals, the majority, 66 percent, answered that they thought the identification process was valid. Only a small percent, 7 percent, thought it was invalid.

TABLE 6.3

PARENT INTIMIDATION

Some parents have said that the presence of so many professional people at the staffing conference is intimidating. In your experience, have parents felt this intimidation?

Yes ______ No ______ Not sure ______

	Yes	No	Not Sure
PCD	68%	18%	12%
SW	72%	19%	6%
Psych.	78%	15%	4%
S/L	79%	13%	7%
Prin.	61%	27%	10%

TABLE 6.4

FOR PCD PUPILS IN COLORADO PERCENT WITH ADEQUATE RECORDS KEPT OF WHO PARTICIPATED IN INITIAL ASSESSMENT AND STAFFING BY YEAR OF STAFFING

Year	Estimated Pop. % with Adequate Records	% of Sample in that Year
Before 1968	9.3%	6.68%
1968-1972	24.0%	.35%
1973	17.4%	1.00%
1974	16.4%	.50%
1975	26.1%	5.20%
1976	43.5%	8.04%
1977	37.1%	10.51%
1978	49.2%	17.57%
1979	50.0%	21.68%
1980	43.5%	28.22%
Missing year data		.25%
		100.00%

TABLE 6.5

LENGTH OF STAFFING CONFERENCES

	Mean	Standard Deviation
Shortest meeting	27 minutes	14 minutes
Typical meeting	45 minutes	17 minutes
Longest meeting	90 minutes	37 minutes

TABLE 6.6

TRADE-OFFS BETWEEN TIME SPENT IN STAFFING, DUE PROCESS, AND ACCURATE IDENTIFICATION

	Professionals				
	PCD	SW	Psych	S/L	Prin
Accuracy--Identification procedures are:					
1 Not thorough enough to identify accurately a PCD child and wasteful of staff time	3%	5%	6%	4%	2%
2 Not thorough enough to identify accurately a PCD child but not wasteful of staff time	20%	14%	16%	18%	6%
3 About right in thoroughness and efficiency	32%	33%	26%	30%	35%
4 Thorough enough to identify accurately a PCD child and not wasteful of staff time	33%	35%	27%	28%	31%
5 Thorough enough but wasteful of staff time	10%	13%	22%	20%	24%
Due Process--Identification procedures are:					
1 Not thorough enough to satisfy due process requirements and wasteful of staff time	3%	5%	6%	4%	1%
2 Not thorough enough to satisfy due process requirements but not wasteful of staff time	9%	8%	6%	6%	2%
3 About right in thoroughness and efficiency	35%	31%	31%	28%	40%
4 Thorough enough to satisfy due process requirements and not wasteful of staff time	35%	38%	31%	25%	26%
5 Thorough enough but wasteful of staff time	15%	17%	24%	36%	29%

Placement. CDE data for the last several years indicate that the great majority of PCD pupils are placed in resource room settings (84 percent). Although the focus of this study is identification rather than treatment, the type of instruction is relevant in assessing the benefits of PCD placement. Therefore, PCD teachers were asked to estimate what percent of their time they spent in different types of instructional activities. Median and mean percentages of time are reported in Table 6.7. About half of the time was devoted to the first two categories, i.e., providing some kind of direct tutoring or remediation of academic skills. Roughly 30 percent of the time was spent in some kind of process training aimed at remediating underlying processing deficits. (The negative research evidence reported for this type of intervention is discussed in Chapter 10.) About 10 percent of time was spent in informal counseling or behavior modification. Another 10 percent was reported for other activities. The variability among teachers in types of instruction was considerable, making it more difficult to interpret the mean or median as indicators of typical practice. Rather it appears that some PCD instructional programs are almost exclusively devoted to academic skills building and other programs have almost none of this.

Summary

The federal and state regulations governing staffings are extensive. Despite some evidence of poor record-keeping, Colorado districts and BOCS are largely in compliance with the rules as to who should be present at staffings.

Because the typical PCD staffing is attended by seven or eight professionals; directors, specialists, and principals agreed that parents are sometimes intimidated by the staffing process.

The majority of professionals involved in the identification of PCD pupils are satisfied with the staffing process. They believe that the amount of time spent is sufficient to insure accurate findings and satisfy due process requirement but is not wasteful of professionals' time.

TABLE 6.7

TIME SPENT* IN DIFFERENT TYPES OF INSTRUCTIONAL ACTIVITIES FOR PCD PUPILS

	Percent of Time		
	Median	Mean	SD
Repetition and drill on basic skills which are prerequisites for regular classroom (grade-level) work	30%	35%	23%
One-to-one instruction or tutoring with regular classroom work	15%	18%	16%
Direct training of psychological processes such as visual discrimination, auditory memory and attention	10%	16%	15%
Process training using materials adapted from regular classroom work	10%	17%	15%
Teaching appropriate behaviors; informal counseling aimed at improving self-concept; or behavior modification	10%	15%	11%
Other	10%	22%	27%
	85%	123%	

---

*PCD teachers were asked to estimate what percent of time they spend in doing each activity out of the total time spent in direct services to PCD students.

7

CHARACTERISTICS OF PCD PUPILS IN COLORADO

What are the characteristics of children who have been evaluated and placed as PCD by the current procedures? How many of them match the officially legislated definitions of PCD and the definitions of learning disabilities described in the professional literature? To answer these questions, we selected a representative sample of PCD case files and analyzed them with either quantitative or qualitative methods.

The quantitative analysis was applied to 790 PCD cases. A coding form was developed that allowed the essential characteristics of the cases to be described, quantified, and analyzed by computer. The purpose guiding the analysis was to determine the proportions of identified PCD pupils that satisfied the various definitions of learning disabilities included in Chapter 3. The qualitative analysis was performed to gain more thorough understanding not only of the characteristics of PCD pupils but the procedures that schools go through to evaluate and place pupils suspected of PCD. The results of the quantitative and qualitative analysis are presented in this chapter.

QUANTITATIVE ANALYSIS

The cases were characterized using the following variables: IQ, verbal-performance IQ discrepancy, weak and strict significant ability-achievement discrepancy, below grade-level achievement, medium-and-high quality processing deficit, emotional disturbance, hyperactivity, brain injury, major or minor behavioral problems, environmental learning problems, non-English language dominance, hearing handicap, and vision handicap. These variables are defined in Table 7.1.

Table 7.1

Defining Characteristics of PCD Pupils in Colorado and Variables Used in the Quantitative Analysis

IQ	Full Scale IQ score on the best IQ test available for each individual child. Tests were ordered as follows: WAIS, WISC-R, WISC, WPPSI, Stanford Binet, PPVT, McCarthy or Slosson, Detroit: so if a child had been given both the WISC-R and the PPVT, the WISC-R score was used.
SIGNIFICANT WISC-R VERBAL/ PERFORMANCE IQ DISCREPANCY	The difference between each child's verbal and performance IQ scores was computed and tested for significance at the .95 level of confidence.
WEAK SIGNIFICANT DISCREPANCY	A child was classified as having a weak significant discrepancy if achievement on any math or reading test was significantly below measured IQ at the .14 level of confidence. Methods for computing the standard errors of the differences between tests and for significance testing are explained in Appendix B.
STRICT SIGNIFICANT DISCREPANCY	A child was classified as having a strict significant discrepancy if achievement on any math or reading test was signicantly below measured IQ at the .95 level of confidence.
BELOW GRADE LEVEL ACHIEVEMENT	The following cut-offs were used arbitrarily to define below grade level performance on achievement tests. grades 1-3 1 year or more 4-6 1.5 years or more 7-9 2.0 years or more 10-12 3.0 years or more
MEDIUM QUALITY PROCESSING DEFICIT	Agreement among professionals: As part of the coding of individual cases, ratings were made of the agreement among professionals in diagnosing a perceptual or processing dysfunction according to the following scale: 4 = Complete agreement 3 = Some confirmation (i.e., a deficit cited in one area such as auditory memory, was confirmed by at least one other professional; but not every deficit cited was confirmed) 2 = No confirmation 1 = Contradictory Further explanation of these ratings is given in Appendix D.

Table 7.1 (continued)

Defining Characteristics of PCD Pupils in Colorado and Variables Used in the Quantitative Analysis

	A child was classified as having medium quality-processing-deficit evidence if the rating was a 3 or a 4. *Note: As is explained in the Appendix, the conclusions of individual professionals were taken at face value, no attempt was made to rate the accuracy of a single professional's test interpretations.
HIGH QUALITY PROCESSING DEFICIT	The high quality processing deficit variable was created from a combination of the agreement among professionals rating explained above and the congruence between professionals and basis of handicap explained below. The agreement between the deficits cited in the placement decision and those cited by professionals was rated as follows: 6 = Confirmed and no contraindicators 5 = Confirmed (i.e., from the list of deficits cited by several professionals only those found by at least two professionals are cited as the basis of handicapping condition) 4 = Some confirmed 3 = All possible deficits listed (i.e., all deficits cited by any professional are included in basis; no attempt to reconcile.) 2 = Mixed inclusion 1 = No evidence (deficits cited in basis for HC are not cited by any professional) 0 = Contradictory (contradicts what professionals said) Further explanation of these ratings is given in Appendix D. For the evidence of a processing deficit to be called high quality the ratings had to be a 3 or better on agreement among professionals and a 4 or better on congruence between professionals and basis of handicap

Table 7.1 continued

Defining Characteristics of PCD Pupils in Colorado and Variables Used in the Quantitative Analysis

EMOTIONALLY DISTURBED	Reports from clinicians indicated that emotional or behavioral problems were severe enough to qualify for placement in the E/B handicapped category.
HYPERACTIVE	Medical evidence in physicians report of hyperactivity, especially if Ritalin was prescribed.
BRAIN INJURED	Hard signs of brain injury were reported by physician; usually either known accident or specific neurological evidence.
MAJOR BEHAVIORAL PROBLEMS	Severe and consistent behavior problems were coded in this category such as aggressive behavior toward teachers, fighting with peers, physical disruption in the classroom.
MINOR BEHAVIORAL PROBLEMS	For a case to be coded with minor behavioral problems, problems had to be consistently reported by the classroom teacher and the psychologist, etc., including poor attention span, frustration with work and poor self concept.
ENVIRONMENTAL LEARNING PROBLEMS	This variable was coded if severe attendance problems or an excessive number of moves were consistently cited by specialists as a source of learning difficulty.
NOT ENGLISH DOMINANT	This "bilingualism" variable was only coded for a child if the influence of a language other than English was great enough to be potentially the source of learning problems; i.e., there was evidence that the child or the child's home was dominant in a language other than English.
HEARING HANDICAPPED	This variable was coded if a severe hearing loss was reported, such that the child could qualify for hearing handicapped placement
VISUALLY HANDICAPPED	This variable was coded if the child had serious vision problems sufficient to qualify for visually handicapped placement. This variable was not used in the computer simulation of categories.

IQ Test Scores

A summary of IQ test data is presented in Table 7.2. Important findings are these: at the time of initial assessment and staffing, 26.8% of PCD pupils were placed in PCD without any IQ test data*; 28.5% had IQs below 90, i.e., below the average range; 8.3% had IQs of 80 or below.

For the roughly 60% of cases who had a WISC-R test, between one-half and one-third had significant verbal-performance discrepancies. This is about a 10% increase over the expected fraction, one-third, found in the normal standardization sample (Kaufman, 1976b)

In summary, only half of the PCD pupils had an IQ test and were in the average or above average range of intelligence as required by some definitions of learning disabilities. The data on verbal performance WISC-R discrepancies look only slightly different from what one would expect in a normal population.

Significant IQ/Achievement Discrepancies

The data in Table 7.3 are reported separately for math and reading achievement and then for the two sets of tests combined. Two different levels of statistical significance were used. Explanations for the statistical tests and methods are given in Appendix B. The stricter criterion, reported at the bottom of the page, is the recommended standard (Salvia & Ysseldyke, 1978). It allows a 5% error rate, i.e., 5% of the IQ-achievement test pairs could be discrepant just by chance. The more relaxed criterion in the middle of the table allows a 14% error rate. The WEAK SIGNIFICANT DISCREPANCY is used in combinations with other possible signs of PCD in subsequent analyses.

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*In some instances (especially in some districts or for older cases) we believe that an IQ test was given and only records of it are missing. For the majority of these cases, however, an IQ test was never administered.

Table 7.2

IQ Test Results for PCD Pupils in Colorado at the Time of Initial Assessment and Staffing

Distribution of IQ Scores	Estimated Population %	Standard Error
65 and below	0.9%	± .3
66 - 70	1.0%	± .3
71 - 75	2.2%	± .5
76 - 80	4.2%	± .9
81 - 85	12.0%	± 1.3
86 - 89	8.2%	± 1.2
90 - 95	10.3%	± 1.4
96 - 100	14.0%	± 1.5
101 - 105	6.9%	± 1.1
106 - 110	6.6%	± 1.4
111 - 115	3.5%	± .9
116 - 120	1.7%	± .5
121 - 125	1.2%	± .5
126 and above	0.7%	± .3
Blank: no IQ Test data	26.8%	± 3.8
	100.0%	
Significant WISC-R Verbal/Performance IQ Discrepancy		
Significant negative discrepancy (Verbal < Performance)	19.0%*	± 2.1
No discrepancy	33.8%	± 3.4
Significant positive discrepancy (Verbal > Performance)	6.2%*	± .9
No WISC-R administered	41.0%	± 3.9

*The criterion for statistical significance (1.96 x the standard error of the difference = 12 points) ensures that the difference is reliable; however, Kaufmann (1976) has shown that in the Standardization Sample for the WISC-R it was normal to have a discrepancy of 10 points, and fully one-third of the normal population had a discrepancy of 12 points or more.

Table 7.3

Percents of PCD Pupils in Colorado with Significant Discrepancies Between Standardized IQ and Achievement Test Scores at the Time of Initial Assessment and Staffing

Types of Missing Data

Almost half of the pupils do not have enough data to compute discrepancies

28.1%	had either no IQ or no achievement test
11.5%	had both tests but not with norms or standard deviations to allow computation of discrepancies (including Key Math)
4.5%	normative data available, but not accessible to researchers because of unusual test manuals
44.1%	

Significant Discrepancy with Weak Significance Criterion ($p < .14$)

	On Any Reading Test	On Any Math Test	On Any Math or Reading Test
No discrepancies	30.4% ± 2.4	34.2% ± 2.6	25.9% ± 2.0
At least 1 discrepancy	24.4% ± 2.1	16.1% ± 1.7	30.1% ± 2.6
Not enough data	45.2% ± 3.2	49.7% ± 3.4	44.1% ± 3.2

Significant Discrepancy with Strict Significance Criterion ($p < .05$)

	On Any Reading Test	On Any Math Test	On Any Math or Reading Test
No discrepancies	35.5% ± 2.6	39.3% ± 2.8	32.6% ± 2.3
At least 1 discrepancy	19.2% ± 1.8	11.1% ± 1.4	23.4% ± 2.2
Not enough data	45.2% ± 3.2	49.7% ± 3.4	44.1% ± 3.2

Table 7.4

Percents of PCD Pupils in Colorado with Significant Discrepancies Between Standardized IQ and Achievement Test Scores Confirmed on a Second Achievement Test at the Time of Initial Assessment and Staffing

	Estimated Population %	
PCD pupils who had only one math test given		38.7%
No significant discrepancy ($p < .14$)	28.0%	
Significant discrepancy ($p < .14$)	10.6%	
No significant discrepancy ($p < .05$)	31.8%	
Significant discrepancy ($p < .05$)	6.9%	
PCD pupils who had two math tests given		11.6%
No significant discrepancy ($p < .14$)	6.2%	
1 significant discrepancy ($p < .14$)	3.4%	
2 significant discrepancies ($p < .14$)	2.0%	
No significant discrepancy ($p < .05$)	7.4%	
1 significant discrepancy ($p < .05$)	3.6%	
2 significant discrepancies ($p < .05$)	0.6%	
PCD pupils who had only one reading test given		40.2%
No significant discrepancy ($p < .14$)	23.6%	
Significant discrepancy ($p < .14$)	16.6%	
No significant discrepancy ($p < .05$)	26.7%	
Significant discrepancy ($p < .05$)	13.6%	
PCD pupils who had two reading tests given		14.5%
No significant discrepancy ($p < .14$)	6.7%	
1 significant discrepancy ($p < .14$)	2.9%	
2 significant discrepancies ($p < .14$)	4.9%	
No significant discrepancy ($p < .05$)	8.8%	
1 significant discrepancy ($p < .05$)	1.8%	
2 significant discrepancy ($p < .05$)	3.9%	

By the strict test which establishes a reliable difference, only 23.4% of the PCD population had a significant discrepancy on even one of their math or reading achievement tests.

Forty percent of the PCD pupils were either missing an IQ test or an achievement test or were given achievement tests without normative data, so it was not possible for us or the staffing committee to calculate a discrepancy. An additional 4.5% of the data were not analyzed because the researchers did not have access to the manuals of some of the more unusual tests.

The discrepancy data in Table 7.4 show the percent of PCD pupils who had a confirmed discrepancy. Only 0.6% of the PCD population had a significant math discrepancy ($p < .05$) confirmed on a second test. Only 3.9% of the PCD pupils had a significant reading discrepancy ($p < .05$) confirmed on a second test. This is partly because only 11.6%* in math and 14.5% in reading had two tests in the same area. Nevertheless, even for PCD children who take two tests, the occurrence of a consistent discrepancy is extremely rare. For PCD children who take two reading tests there is a tiny but perhaps interpretable proportion who have confirmed discrepancies.

Out of every 100 students already placed as PCD, only 23 had reliable evidence of a discrepancy between ability and achievement.

Years-Below-Grade Level

Years-below-grade level data are reported in two different formats. In Table 7.5, the average years (or months) below grade level are reported in grade equivalent units for children in that level. In Table 7.6, the same data are recast to show how many cases met the criteria for "below-grade-level" stipulated in the left margin. The distribution of achievement

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*Many students also had Key Math, but discrepancies could not be computed because Key Math has neither standard deviation nor percentile norms.

Table 7.5

AVERAGE YEARS - BELOW** - GRADE-LEVEL OF PCD PUPILS IN COLORADO AT THE TIME OF INITIAL ASSESSMENT AND STAFFING

	MATH								READING								LANGUAGE						SPELLING					
	WRAT	PIAT	KEY	CTBS	ITBS	SUCHER ALLRED	OTHER	ALL	WRAT	PIAT REC	PIAT COMP	WOODS	CTBS	SUCHER ALLRED	OTHER	ALL	WRAT	PIAT	CTBS	ITBS	OTHER	ALL	WRAT	PIAT	CTBS	ITBS	OTHER	ALL
Pre-school & Kindg.	-.40*	0.04	-.07				.5	-.23	-.13	-.2	-.8				.3	-.18		-.21				-.21	-.28	-.32				-.39
n=	7	13	1				1	19	6	14	1				1	17		10				10	6	12				15
Grade 1**	-.02	.3	.11	-.35	.2		-.11	.16	.20	.23		.00	.20	.5	.3	.22	1.1	-.1		.4	.36	-.01	.09	.2			.25	.16
n=	47	51	14	2	1		15	102	49	50		8	2	1	17	97	1	43		1	10	52	41	45			4	81
Grades 2-3	.28	.34	.26	.95	.26	.30	.41	.28	.40	.61	.8	1.15	.52	1.58	.85	.60	.7	-.31	1.1	1.0	.63	-.14	.58	.63	1.3	.3	.7	.62
n=	72	72	23	2	7	2	21	149	70	71	30	2	6	4	34	157	3	62	2	2	10	74	68	67	1	1	3	114
Grades 4-6	1.59	1.24	1.57	.88	.90		1.4	1.4	1.59	1.47	1.49	2.19	1.43	1.20	2.44	1.8	.60	.51	2.1	1.2	2.04	.85	1.94	1.94	2.40		2.0	1.9
n=	87	62	52	4	1		17	161	85	59	48	51	3	1	39	170	2	49	3	1	15	68	82	59	2		6	126
Grades 7-9	3.31	1.46	2.94		2.55		2.86	3.07	1.99	2.80	2.44	2.39	2.90	4.0	3.46	3.97	4.4	1.37		3.0	3.5	1.75	3.19	3.34			3.3	3.21
n=	38	50	14		2		10	84	31	52	45	13	2	6	27	94	1	45		1	5	50	35	54			5	72
Grades 10-12	5.20	4.5	4.33				3.9	4.8	3.79	4.81	4.16	6.02			3.7	4.5		3.31				3.31	4.85	5.72				5.18
n=	12	14	3				1	24	10	15	12	5			4	27		12				12	11	13				22

*minus signs indicate an average that is above grade level.

**grade 1 was originally in one category with grades 2 and 3 but because the grade 1 population is not always below grade level, the grade 2 and 3 deficits were obscured.

Table 7.5

AVERAGE YEARS - BELOW** - GRADE-LEVEL OF PCD PUPILS IN COLORADO AT THE TIME OF INITIAL ASSESSMENT AND STAFFING

	MATH								READING								LANGUAGE						SPELLING					
	WRAT	PIAT	KEY	CTBS	ITBS	SUCHER ALLRED	OTHER	ALL	WRAT	PIAT REC	PIAT COMP	WOODS	CTBS	SUCHER ALLRED	OTHER	ALL	WRAT	PIAT	CTBS	ITBS	OTHER	ALL	WRAT	PIAT	CTBS	ITBS	OTHER	ALL
Pre-school & Kindg.	-.40*	0.04	-.07				.5	-.23	-.13	-.2	-.8				.3	-.18		-.21				-.21	-.28	-.32				-.39
n=	7	13	1				1	19	6	14	1				1	17		10				10	6	12				15
Grade 1**	-.02	.3	.11	-.35	.2		-.11	.16	.20	.23		.00	.20	.5	.3	.22	1.1	-.1		.4	.36	-.01	.09	.2			.25	.16
n=	47	51	14	2	1		15	102	49	50		8	2	1	17	97	1	43		1	10	52	41	45			4	81
Grades 2-3	.28	.34	.26	.95	.26	.30	.41	.28	.40	.61	.8	1.15	.52	1.58	.85	.60	.7	-.31	1.1	1.0	.63	-.14	.58	.63	1.3	.3	.7	.62
n=	72	72	23	2	7	2	21	149	70	71	30	2	6	4	34	157	3	62	2	2	10	74	68	67	1	1	3	114
Grades 4-6	1.59	1.24	1.57	.88	.90		1.4	1.4	1.59	1.47	1.49	2.19	1.43	1.20	2.44	1.8	.60	.51	2.1	1.2	2.04	.85	1.94	1.94	2.40		2.0	1.9
n=	87	62	52	4	1		17	161	85	59	48	51	3	1	39	170	2	49	3	1	15	68	82	59	2		6	126
Grades 7-9	3.31	1.46	2.94		2.55		2.86	3.07	1.99	2.80	2.44	2.39	2.90	4.0	3.46	3.97	4.4	1.37		3.0	3.5	1.75	3.19	3.34			3.3	3.21
n=	38	50	14		2		10	84	31	52	45	13	2	6	27	94	1	45		1	5	50	35	54			5	72
Grades 10-12	5.20	4.5	4.33				3.9	4.8	3.79	4.81	4.16	6.02			3.7	4.5		3.31				3.31	4.85	5.72				5.18
n=	12	14	3				1	24	10	15	12	5			4	27		12				12	11	13				22

*minus signs indicate an average that is above grade level.

**grade 1 was originally in one category with grades 2 and 3 but because the grade 1 population is not always below grade level, the grade 2 and 3 deficits were obscured.

Table 7.6

PCD PUPILS WHO MEET A YEARS BELOW GRADE LEVEL CRITERION AT THE TIME OF INITIAL ASSESSMENT AND STAFFING

Figures are the number who meet the criterion out of the number of cases who have achievement tests in that category.

	MATH ACH.	READING ACH.	LANGUAGE ACH.	SPELLING ACH.
Preschool and Kindergarten .5 years below grade	1/19	1/17	2/9	1/15
Grade 1 .5 years below grade	39/102	27/97	16/52	21/81
Grades 2 and 3 1.0 years below grade	23/149	44/157	20/74	33/114
Grades 4-6 1.5 years below grade	73/161	109/170	26/68	84/126
Grades 7-9 2.0 years below grade	54/84	69/94	27/50	60/72
Grades 10-12 3.0 years below grade	20/24	22/27	6/11	22/22

spreads out in the higher grades, so it is increasingly "normal" for many children to be behind 1 year or 2 or even 3 years compared to the median grade score. Therefore, cut-offs have been set which increase with grades and which correspond to the cutoffs often implicitly used by clinicians.*

Many PCD pupils were not functioning below grade level as measured by standardized achievement tests. In Table 7.5, occasional minus signs in the early grades reflect an average for PCD pupils that was above grade level. In grades 2 and 3 the average grade equivalent score was about four months below grade level; another way of saying the same thing is that, in Table 7.6, fewer than half the cases met the below-grade-level criterion. In grades 4-6 the mean score was about 1.5 years below grade, consistent with slightly more than half the cases meeting the criterion for academic deficit. In the junior high and high school grades the achievement lags appear more substantial. It should be remembered, however, that while being 1 year behind in grade 2 places students near the 10th percentile of all second graders, being 3 years behind in grade 11 corresponds more closely to the 26th percentile of all eleventh graders. Thus, these large and real deficits are not as deviant as one might suppose.

Kindergarten and first-grade children who were in PCD were not, on average, appreciably behind their grade peers. Only about half of the fourth-sixth grade PCD children met an academic deficit criterion set at 1.5 years below grade level. PCD pupils in junior high and high schools were much further behind. It is also true that in the higher grades, many normal children are also behind by the same amount (the 3 years-below-grade level deficit corresponds roughly to the 25th percentile in the normal population).

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*In fact, however, if these cut-offs were compared to actual percentile ranks one would see that the higher grade criteria are set much higher; i.e., many more "normal" children will fall below the upper grades criterion. See specific example on page .

COMPLEX ANALYSIS: QUANTITATIVE IDENTIFICATION OF SUBGROUPS IN THE PCD POPULATION

The preceding comparison of actual PCD pupil characteristics with each definitional requirement separately gives only a crude and potentially misleading picture of the overall validity of PCD placements. First, the counts of cases who meet all, only one, or none of the operational criteria cannot be inferred from the separate analyses. At one extreme, if the cases who met one requirement were the same ones who satisfied each of them, there would be one group of highly valid (and likely severe) PCD placements and another rather large group who satisfied none of the criteria. At the other extreme, if every case met one and only one definitional requirement we could add the percents from the separate analyses and come to very nearly 100% of all the cases who satisfied one or another of the eligibility criteria. The defining characteristics must be studied simultaneously to see the overlap in criteria supporting placement. Furthermore, only by considering indicators in combination is it possible to see if the pattern of signs justifies placement in PCD even when no one indicator is significant by itself.

The computer analysis of identifiable subgroups in the PCD population was intended to parallel, with the 790 coded cases, the same "clustering" of PCD cases that had been done narratively with the 200 intensively studied sample of cases. We call it a complex analysis because complicated computerized decision rules were written to assign cases to mutually exclusive clusters on the basis of each child's most salient characteristics. The criteria we used to create each cluster are then the "implicit definitions" of what qualified these children for PCD placement.

The computer analysis derived many insights from the narrative study of cases. Potential categories and, in some instances, defining variables were suggested by the in-depth study. However, the computer analysis was independent of the narrative description of cases in that its data base was a completely separate but randomly equivalent sample of pupils. The computer analysis was also objective, so that once the decision rules were arrived at, they were implemented without subjective control over the size of each cluster. Because the simulation was limited to the coded variables, it was both more objective and more crude. Nevertheless by using combinations of variables and hierarchies of inclusion and exclusion rules it was possible to "model" the reasoning and combination of signs used in clinical interpretations.

Hierarchical Design

Some variables were more important than others in deciding which category a case should be assigned to. For example, a child could have a highly significant discrepancy between ability and achievement but also have several reports that she is emotionally disturbed with severe behavior problems. If the emotional disorder were sufficient to explain the discrepancy and there were no other signs of a learning disability, the emotionally disturbed classification would take precedence. The logic followed in creating categories is described below. It follows a hierarchical design so that (with a few exceptions which we explain) the order of categories represents the strength of the defining characteristics. PCD pupils were assigned to the topmost category first if they met the decision rule; only the remaining cases were considered for inclusion in subsequent clusters.

Most of the identifiable clusters within the PCD population were created by the combination of two or three variables. The description of each separate variable is presented in Table 7.1.

Language Interference

First, pupils were assigned to this group if they were NOT ENGLISH DOMINANT. This variable, explained in Table 7.1, was coded only if the child's lack of fluency in English was severe enough to be the cause of the child's academic problems. (This would not be the case for most bilingual children.)

Pupils were also classified as LANGUAGE INTERFERENCE if they were Chicano or Indian AND had a significant VERBAL/PERFORMANCE IQ DISCREPANCY. Many Chicano and Indian children in the sample did not meet this criterion; but those who had a verbal IQ score significantly below their performance IQ were believed to have language or cultural differences which were sufficient to explain their learning difficulties in the school setting.

Finally, any of the above children were excluded from this category if they had a HIGH QUALITY PROCESSING DEFICIT. In other words, for most children who met the above criteria (for non-English dominance or depressed verbal performance due to cultural and language differences), language interference was a better description of the nature of their learning problems than PCD. However, those who also had a validly confirmed processing deficit were taken out and put in a later learning disability category.

The percent of the PCD population estimated to be in the Language Interference cluster was 6.6. We consider this to be an underestimate because ethnicity information was only available for half the cases and because stringent criteria were used for the designation of non-English dominance and a significant verbal performance discrepancy on the WISC-R.

Educable Mentally Retarded (EMR)

Children whose full-scale IQ scores were 75 or less were placed in this cluster. However, because a learning disability caused by a perceptual or processing dysfunction could substantially reduce performance on an IQ test, cases were again removed from this category if they had a HIGH QUALITY PROCESSING DEFICIT and were assigned to a later learning disabled category.

If a pupil satisfied both the Language Interference and the EMR criteria they remained in the Language Interference group because this group had logical priority, i.e., the language problem could also depress the IQ score.

Two percent (2.2%) of the PCD population is in this relatively extreme EMR category.

Emotionally Disturbed

When the individual files were read and coded, cases were identified as EMOTIONALLY DISTURBED if reports from various clinicians indicated that the child's emotional or behavioral problems were severe enough to qualify for placement in the E/B handicapped category. Coders tended to be conservative in marking this variable. Evidence had to be very clear-cut, otherwise the assumption was made that the clinicians believed that the emotional problem was secondary to the learning disorder.

In addition, pupils who had MAJOR BEHAVIORAL PROBLEMS, sufficient to account for their poor achievement, were counted in this category.

Again, pupils who satisfied one of these criteria but had a HIGH QUALITY PROCESSING DEFICIT were excluded and placed in a later LD category, because in that case the observed behavioral disorder could well be the result of the learning disability. In the absence of this type of evidence, however, it is more plausible to attribute the poor academic functioning and even a significant discrepancy between ability and achievement to the emotional or behavioral disorder.

Of the PCD population, 7.5 percent were classified as Emotionally Disturbed. An additional 1.0% of the population has severe behavioral or emotional disorders but were already counted in either the EMR or Language Interference categories.

Strict Significant Discrepancy

After eligible pupils had been assigned to the above categories, the remaining cases were searched and any pupil with a significant IQ/achievement discrepancy on any math or reading test was assigned to this category. It is called the STRICT SIGNIFICANT DISCREPANCY group because the statistical criterion used to test the reliability of the difference between IQ and achievement is set at the $\alpha = .05$ level of significance. (These procedures are described in Appendix B.) This is the standard criterion proposed in the literature (Salvia & Ysseldyke, 1978) and is one which in the long run would allow 5% of the cases to have this big a difference just by chance. (However, we later use a more liberal significance level in combination with other variables.)

A tiny subgroup of those pupils with a strict significant discrepancy also had high quality evidence of a processing deficit. They remain in this category, however, because this simply means they have two strong signs of a learning disability.

Of the PCD population, 20.5% were in the Strict Significant Discrepancy group.

High Quality Processing Deficit

The definition of this variable is given in Table 7.1 and its components are further described in Appendix D. For the evidence of a processing deficit to be considered high quality, satisfactory ratings on two separate variables were required. First, there had to be at least some confirmation among professionals as to the nature of the processing problem (a rating of 3 or better). That is, when two or three professionals submitted reports and cited areas of perceptual or processing dysfunction, at least some of the deficits cited had to be confirmed by more than one specialist. Second, when the reports of individual specialists were compared to the "basis for determination of handicap" in the overall placement decision, there had to be congruence between the two and a rationale which explained the deficits included in the final report. Ratings which contributed to the HIGH QUALITY designation (4 or better) were those which reflected any attempt to reconcile reports from various professionals or the tendency to include statements of deficits in the placement decision which had some confirmation. A score of 3 was assigned to staffing reports which exhaustively listed all weaknesses found by all specialists, with no attempt to reconcile differences in findings, and was not considered high quality.

Of the PCD population, 4.7% were identified in this High Quality Processing Deficit category.

Brain Injured

PCD children who had hard signs of brain injury reported by a physician and had not met the criteria for the two previous LD categories were placed in a special BRAIN INJURED category of learning disabilities. This group accounted for 0.6% of the PCD population.

Hyperactive

Children who did not qualify for assignment in any of the above clusters and who had medical reports of hyperactivity were identified in this group. Often this meant they were taking Ritalin. In a very small number of cases confirming reports from two or more clinicians would qualify in place of a physician's diagnosis of hyperactivity. However, classroom teachers' reports of hyperactive behaviors were not counted without a physician's corroboration.

Of the PCD population, 20% fell in this hyperactivity category.

Weak Significant Discrepancy and Verbal/Performance IQ Discrepancy

All the above clusters are based on fairly strong indicators that the children were or were not learning disabled. Up to this stage in the analysis these highly interpretable and reliable variables accounted for 44.5% of the PCD population, placing them in either the two learning disabled categories, other handicaps or the Language Interference cluster. After all possible assignments had been made to these clusters, the remaining cases were examined for combinations of weaker indicators that would account for their PCD placement.

The statistical criterion for determining the reliability of the difference between IQ and achievement was relaxed from 1.96 to 1.5 standard errors of the difference, corresponding to a shift in the percent of differences occurring just by chance from 5% to 14%. Pupils who met this lowered cut-off were said to have a WEAK SIGNIFICANT DISCREPANCY.*

Because this more liberal level of significance is not generally recommended in practice (Salvia & Ysseldyke, 1978; Thorndike & Hagen, 1977), it was used in conjunction with a second indicator, a significant VERBAL/PERFORMANCE IQ DISCREPANCY, which is also not considered a valid sign of a learning disability in and of itself (Kaufmann, 1976b). Together, however, these two indicators help to rule out the possibility that either discrepancy occurred by chance; and they begin to suggest a pattern of irregularities or discrepant strengths and weaknesses in learning processes.

A group meeting this pair of requirements accounted for 3.6% of the PCD cases.

Weak Significant Discrepancy and Medium Quality Processing Deficit

Following the same reasoning as above, a WEAK SIGNIFICANT DISCREPANCY was also combined with a MEDIUM QUALITY PROCESSING DEFICIT. Cases were said to have medium quality evidence of a processing deficit if there was some confirmation of some of the deficits cited by various professionals, but not necessarily a correspondence between the confirmed deficits and what was reported to explain the placement decision. In other words, cases which were not eligible for the HIGH QUALITY PROCESSING DEFICIT category but had a MEDIUM QUALITY PROCESSING score were placed in this group. They satisfied the first but not the second requirement for HIGH QUALITY. They account for 1.1% of the PCD population.

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*We call this a weak significance criterion because it allows 14% of all IQ/achievement scores to be this different just by chance. Therefore, in a group of normal children 7% would have their achievement "significantly" below their IQ.

Medium Quality Processing Deficit and Verbal/Performance IQ Discrepancy

A third category was created of less reliable variables by requiring both a MEDIUM QUALITY PROCESSING index and a significant VERBAL/PERFORMANCE IQ DISCREPANCY. Again, the two indicators together more likely suggest that a problem exists, where a single indicator would be less compelling. For example, the 12-point difference, required to make sure the verbal-performance discrepancy is reliable, does not guarantee its validity as a sign of learning disabilities. Fully one-third of the normal population in the standardization sample for the WISC-R had a difference this large or larger (Kaufman, 1976b).

The percent of the Colorado PCD population in this group was 6.6.

Slow Learners

The raw data reported in Table 7.2 show that 28.5% of the PCD population have IQ scores below 90, suggesting that they do not have average ability and hence may be behind in school simply because of their generally lower intellectual ability. We did not call this entire group slow learners, however, because we wanted the simulation to reflect the reasoning that obtained IQ scores could have been lowered by the presence of a learning disability. Therefore, the slow learner category was only entered in the hierarchy after all the strong and weak indicators of learning disorders had been entered; a child who met both criteria would be counted in the LD group. Slow learners were defined as cases with IQs less than 90 and none of the preceding signs of a processing disorder or significant discrepancy. The decision rule to exclude from the slow learner cluster those with processing deficits gives the benefit of the doubt to clinical judgments and underestimates the number of true slow learners. As explained in Chapter 5, clinicians often agree that a child has a processing deficit when scores are below age norms; they do not, however, consider whether the low processing scores are uniformly low and commensurate with low IQ, therefore making it more likely that the child is a slow learner and not learning disabled. We did not try to introduce this consideration into the analysis.

Using these decision rules, 11.4% of the PCD population are Slow Learners.

Environmental Problems

When PCD files were originally read and coded, cases received an "environmental" code if the number of times the children had changed school or the numbers of absences were so extreme as to be a cause of serious learning problems. Ten percent (9.5%) of the PCD population were identified with severe problems of this type. At this stage in the hierarchy, a case which had not been selected from any previous category was placed in the Environmental Problems group. For these children without other signs for learning disabilities or other handicaps, the very best explanation of their learning problems is a lack of opportunity to learn. Two percent (2.2%) of the PCD population were identified as having environmental problems.

Medium Quality Processing Deficit

Finally, after other stronger and more reliable indicators had been used, remaining cases that had only a MEDIUM QUALITY PROCESSING DEFICIT were placed in this group. These cases had no ability-achievement discrepancy but were cited by at least two clinicians as having a particular processing deficit. This medium quality processing group was 3.5% of the PCD population.

Hearing Handicapped

Children who were reported to have severe hearing loss and who had not been selected for any previous category were placed in this group; they represent only .2% of the PCD population. An additional 1.5% of the PCD population were identified as hearing or vision handicapped but these cases also had other characteristics which allowed them to be placed in previous categories.

Poor Assessment

Cases in this group were missing both IQ tests or achievement tests or both. This meant that neither we nor the clinicians involved in staffing could judge whether achievement was significantly behind expectancy. Furthermore, if perceptual or processing tests had been given, the clinical reports did not have enough consistency even to qualify for the MEDIUM QUALITY PROCESSING DEFICIT rating used to create a prior cluster. This category accounted for 6.4% of the PCD cases.

Below Grade Level Achievement

This category is a hodge-podge of cases that did not fall into any of the previous clusters. Using the cut-offs reported in Table 7.1 for below grade level performance, cases with lagging achievement were counted in this category. One-fourth of this group had IQ tests and did not qualify for any of the significant discrepancy clusters or the Slow Learner group. Most of these cases had IQ scores in the 90-95 range, so their below average achievement was consistent with their slightly below average IQ. It should be remembered that although the below grade level cutoffs were selected to reflect typical decision rules followed by clinicians, on a typical test (the PIAT for example) these cutoffs correspond to the 10th percentile (for 2nd graders on PIAT math), 12th percentile (for 5th graders on PIAT math), the 26th percentile (for 8th graders on PIAT math) and the 26th percentile (for 11th graders on PIAT math). An IQ of 90 is at the 25th percentile; an IQ of 95 is the 37th percentile. Computations which allow for unreliability in the scores would require either that achievement be well below the cutoff or that IQ be well above 90 for the lower grades (higher for the lower grades) to produce a significant discrepancy.

Three quarters of the Below-Grade-Level group did not have IQ test scores. By comparing the distribution of achievement scores for this subgroup to the distribution for those with IQ scores, it is possible to estimate how many cases are like the first group, below grade level but not significantly below ability. This accounts for most of the subgroup. The remaining cases are those who might have had significant discrepancies if a measure of ability had been administered. 6.1% of the PCD population were in the below grade level cluster.

Minor Behavior Problems

Children who did not have any of the above indicators of learning disabilities or academic problems and who had minor behavior problems were counted in this category. During the coding of case files, researchers coded MINOR BEHAVIORAL PROBLEMS if the classroom teacher and clinicians had consistently noted problems such as poor attention span, inability to stay in seat, frustration with work. 3.7% of the PCD were in this cluster.

Miscellaneous

A residual group, 10.6% of the PCD population could not be classified by the above decision-rules. Some of these children might have been classifiable if the data had been better or if the analysis had been more sensitive. The weight of evidence suggests, however, that these PCD cases could not be categorized because they did not have any of the signs of the disorder, not because the analysis was inaccurate. These 11% of the PCD population had no significant discrepancy, were not below grade level, had no consistent evidence of a processing disorder, did not have IQs below 90, could not be described as emotional or hearing handicapped and did not have even the weaker indicators of learning disabilities.

Summary of Identifiable Subgroups in the PCD Population

The percentages of PCD cases in each of the computer identified clusters are summarized in Table 7.7 which recapitulates the hierarchical design of the analysis. The same data are reorganized in Table 7.8 into five major categories; other handicapping conditions, which includes 10% of the PCD population; the learning disabled groups, 41% of the PCD population; children with behavior problems only who are 6% of the PCD population; children with other learning problems, 24% of the PCD cases; and an other category which includes poor assessments, normal children and other miscellaneous; 17% of the PCD cases.

RESULTS OF QUALITATIVE ANALYSIS OF CASES

The ten case histories in Chapter 8 were chosen from 200 PCD case files in the qualitative analysis. These 200 files were representative of pupils identified as PCD in Colorado. The files were studied to gain general understanding. Five research questions or categories emerged from the qualitative analysis, and the cases were classified according to each one, as follows (Table 7.9).

Significance of Discrepancy. For each case, we recalculated the difference between the pupil's general intellectual ability, or IQ score and his achievement test score in reading, arithmetic, and language. We applied a test of statistical significance to this difference to see if it could be simply a random difference or if it exceeded chance; i.e., was significant. This procedure was recommended by Salvia and Ysseldyke (1978, p. 423) and consists of 1.96 standard errors of difference between the two test scores. If a pupil's difference exceeded this criterion on any of the three areas of achievement tests, we counted that pupil as having a significant discrepancy. Out of the files thus analyzed, 16 percent had insufficient data to calculate the significance of the discrepancy. Of all the cases, 39 percent had discrepancies that were statistically significant by the criterion employed. Forty-five percent of all the cases had non-significant

Table 7.7

QUANTITATIVE IDENTIFICATION OF SUBGROUPS IN THE COLORADO PCD POPULATION IN HIERARCHICAL ORDER

Hierarchical design: pupils who qualified for two or more categories were always placed in the highest category. The only exception to this rule was that Language Interference, EMR, or Emotionally Disturbed cases which also had high quality evidence of a processing deficit were removed and placed in the High Quality Processing group.

	Estimated Pop. %	Standard* Error
Language Interference	6.6%	± 1.0
EMR	2.6%	± .6
Emotionally Disturbed	7.5%	± 1.0
Strict Significant Discrepancy	20.5%	± 2.0
High Quality Processing Deficit	4.7%	± .8
Brain Injured	.6%	± .3
Hyperactive	2.0%	± .6
Weak Significant Discrepancy and Verbal/Performance Discrepancy	3.6%	± .6
Weak Significant Discrepancy and Medium Quality Processing Deficit	1.1%	± .4
Medium Quality Processing Deficit and Verbal/Performance Discrepancy	6.6%	± 1.2
Slow Learners	11.4%	± 1.4
Environmental Causes of Learning Problems	2.2%	± .6
Medium Quality Processing Deficit	3.5%	± .8
Hearing Handicapped	.2%	± .2
Poor Assessment (no IQ and no achievement tests)	6.4%	± 1.3
Below Grade Level	6.1%	±
Minor Behavioral Problems	3.7%	± .8
Miscellaneous (including normal)	10.6%	± 1.3
	100.0	

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*Standard error values represent the amount of statistical error that occurs in estimating population percents from sample data. Confidence intervals can be constructed for each statistic by ± 2 times the standard error: 95% of the time the population value will be within the interval. For example, the 95% confidence interval for the Language Interference percent is from 4.6% to 8.6%.

Table 7.8

QUANTITATIVE INDENTIFICATION OF SUBGROUPS IN THE COLORADO PCD POPULATION PRESENTED IN MAJOR CATEGORIES

OTHER HANDICAPS	ESTIMATE POP. %
EMR	2.6%
Emotionally Disturbed	7.5%
Hearing Handicapped	.2%
	10.3
LEARNING DISABILITIES (true PCD)	
Strict Significant Discrepancy	20.5
High Quality Processing Deficit	4.7
Brain Injured	.6
Weak Sign Discrep. and V/P Discrep.	3.6
Weak Sign Discrep. and Med. Qual. Proc.	1.1
Medium Qual. Processing Deficit and Verbal/Performance Discrep.	6.6
Medium Quality Processing Deficit only	3.5
	40.6
OTHER BEHAVIOR PROBLEMS	
Hyperactive	2.0%
Minor Behavior Problems	3.7%
	5.7
OTHER LEARNING PROBLEMS	
Language Interference	6.6%
Slow Learners	11.4%
Below Grade Level	6.1%
	24.1
OTHER	
Poor Assessment (No IQ and no Ach. tests)	6.4
Miscellaneous (including normal	10.6
	17.0

or simply random differences between their ability scores and any of their achievement scores.

Marginal Placements. The cases were classified according to whether their placement was marginal or clearly indicated. If the pupil's symptoms were mild, if the clinical signs of his disability were equivocal, and if we judged that his need for help from special education was not obvious, he was counted as a marginal placement. Out of the cases studied, 35 percent were categorized as marginal placements.

Consistency. In all but the smallest districts, the child considered for placement in PCD programs is evaluated by three, four, five, or even more professionals. The same characteristics evaluated frequently by one professional are evaluated by others. Thus one frequently sees separate tests of intelligence given by the psychologists, the special education diagnostician, and the speech-language specialist.. Auditory processing is also evaluated by separate tests given by each of these professional groups. The pupil's medical development is evaluated by both social worker and nurse. And his emotional adjustment is evaluated by both social worker and psychologist. No one would expect complete agreement among these different clinical appraisals. However, some consistency is expected; for example, separate assessments of intellectual potential should yield about the same results, identification of specific strengths and weaknesses ought to converge and not conflict. If a child's weakness is in reading, more than one test of reading achievement ought to reflect that.

Operating under these assumptions, we judged the consistency of evidence across clinicians and tests. Of the cases studied, the clinical evidence of 68 percent was judged to be of poor consistency. The remaining cases had good consistency; that is, the tests and clinicians presented evidence that converged on a coherent picture of the child's problems and characteristics.

Cluster. The typology of symptoms and characteristics was developed and the cases were classified by type. Their test results, histories, and reported symptoms were studied carefully and judged to fall into one of the following clusters.

1) Operational LD--The official definition of learning disabilities is achievement significantly below ability. Pupils are excluded from this definition if their ability-achievement discrepancy can be explained by language, emotional, or cultural disability. Of the cases studied 21 percent fell into this cluster.

2) Clinical LD--According to the professional literature, children with learning disabilities may not have a significant discrepancy between their ability and achievement either because they have compensated for their specific disability through their stronger, intact abilities or because their psychological processing disability depressed not only their achievement scores but their ability test scores. Children in this cluster, therefore, had no significant discrepancies between ability and achievement, but did have convincing evidence of a processing disorder that was consistent across tests, clinicians, and time. Five percent of the cases fell into this cluster.

3) Slow learner--Profiles of the learning disabled tend to contain both significantly high and low scores on separate abilities. Slow learners, in contrast, have all their separate abilities approximately the same and lower than those of children their own age. This is not considered to be a handicap by official or professional definitions. Of all the files of chilren placed as PCD and sampled for qualitative analysis, 13% were classified as slow learners. An additional 1% was classified as mentally retarded, having an IQ of less than 75 and no evidence of processing disorders.

4) Emotionally-Disturbed--Twenty-two percent of all the PCD cases

studied in the qualitative analysis were judged to be emotionally disturbed rather than learning disabled. That is, the evidence about their psychological maladjustment was utterly convincing; the evidence of their processing disabilities was weak or non-existent. Some were victims of child abuse or severe family problems. They were said to be highly anxious or deeply withdrawn, abusive, hyperactive, or emotionally unstable. In some cases the parents or professionals resisted the label emotionally disturbed and opted for PCD as the preferred label or treatment. In other cases programs for the emotionally disturbed were not available in the district. In still other cases the professionals appeared to believe that these children actually were PCD and indeed some of the children had significant ability achievement disprepancies. However, the weight of evidence for these cases made it more reasonable to attribute the discrepancy to the emotional problem than to a perceptual or learning disorder. Regardless, a sizable share of PCD cases seemed to fall into this class.

5) Language Problem--Twelve percent of the children represented in the PCD files are of the following type. They are of Hispanic of Indian descent. Some native language is spoken in their homes. Their verbal abilities are significantly lower than their performance or quantitative abilities. They are evaluated by school clinicians to be PCD because of their low achievement, differences between language and non-language achievement, and difference between their scores on the verbal and performance score on the Wechsler Intelligence Scale. This latter characteristic is mistakenly judged as a marker of perceptual disorder when it probably marks language interference and signals the need for intensive training in English or some other language program.

6) Hearing, Vision, or Health--Some children have been categorized as PCD when their primary problem relates to visual or hearing acuity or they have epilepsy or a physically based motor problem. Seven precent of the files in the qualitative analysis fell into this cluster.

7) Miscellaneous--Twenty percent of the cases did not fall into the above clusters, and are therefore included in this category. For example, 8 percent had no discernable handicaps or problems at all and no characteristics that allow us to typify them. Perhaps they were simply children who were the lowest in classes or schools of above average children. Some looked more like underachievers (3%) than like children with handicaps. Some seemed to be slower to develop than children of their own age, but were not outside the normal distribution of developmental rates (5%). And some had problems that appeared to be attributed more to teaching problems, the classroom situation, or teacher-pupil conflicts than to any psychological characteristics of the children themselves (4%).

Necessity for Special Education. All of the children whose cases were chronicled in the PCD files were judged by school committees to need help from special education. Yet as we read the cases it was readily apparent that some were more in need than others. Some had all their achievement scores years behind their classmates while others were only a month behind in spelling. Some needed only a little more flexibility on the part of their classroom teacher. Some, perhaps, needed only to change from open-space to a self-contained class. Some needed only to have their parents' expectations become more realistic. We judged whether each child needed help from special education. Sixty percent needed this help. Eighteen percent needed no help, beyond that which a classroom teacher ought to be able to give. Twenty-two percent were judged to need a kind of help different from that which is typically available in PCD programs--psychotherapy, intensive English, tutorial help in basic skills. Emotionally disturbed children and children with second language problems do not need process training nor sensory-motor integration therapy. All children who are behind their classmates do not need diagnosis, nor handicapping labels, but simple remedial help.

Hypotheses. In addition to the categories defined above, the qualitative analysis of cases yielded some hypotheses about how PCD identification works. For example, implicit definitions for learning disabilities are more important than official or professional ones. The most prominent implicit

Table 7. 9

Results from Qualitative Analysis of PCD Case Files

Category	Percent of Cases Studied
Significance of Discrepancy	
Significant	45%
Non-Significant	39%
Insufficient Data	16%
Marginal Placements	35%
Consistency of Evidence	
Good Consistency	32%
Poor Consistency	68%
Cluster	
Operational LD	21%
Clinical LD	5%
Slow Learner	13%
Emotionally Disturbed	22%
Language Problem	12%
Health, Vision, or Hearning	7%
Miscellaneous	20%
Necessity for Special Education	
Needs no help	18%
Needs help	60%
Needs help other than PC program	22%

defining characteristic is "the child whose achievement is behind his classmates." The child who is behind is likely to be staffed and placed as PCD even though he doesn't meet the official criteria.

Although many children need extra help, many more children are identified as PCD than show any true symptoms of that handicap.

Instructional failure, teacher problems, and the like are rarely suggested as the explanation for a child's poor performance. The problem is always located "in the child" according to the PCD files.

Reliability and validity of tests, the validity of subtest-based diagnosis, or the adequacy of clinical judgment is never considered as an explanation for observed patterns of a child's performance and characteristics.

The complexity of a district's identification and staffing process seems to be a function of its resources. Richer, more sophisticated districts are more likely to involve more types of professionals (occupational therapists, adaptive physical educators, etc.). The validity of decision-making does not necessarily increase with greater numbers of professionals. But the cost certainly does.

TRIANGULATION OF THE RESULTS OF QUANTITATIVE AND QUALITATIVE ANALYSES

Two different methods were used to study the characteristics of PCD pupils. The quantitative analysis consisted of the objective quantification of the cases and was most similar to document analyses in survey research (Holsti, 1969). The qualitative analysis resembled most closely the clinical case study methods (Denzin, 1971) that follow the epistemology of Verstehen (Truzzi, 1974). The results of the two methods are compared in this section.

Webb, Campbell, Schwartz, and Secrest (1966) called this "triangulation." Any method of research or measurement has an inherent kind of error. Two different methods produce errors of different kinds. When multiple methods converge on the same finding, it is a strong one.

"If a proposition can survive the onslaught of a series of imperfect measures, with all their irrelevant error, confidence should be placed in it" (Webb, et al, 1966, p. 3).

Furthermore, discrepant findings produced by multiple methods are not necessarily to be decried, for they lead to better insight into the phenomenon studied and to the methods used to study it.

The qualitative and quantitative analyses of PCD cases were alternative methods of studying the same phenomenon. They were not independent of eachother in that the formation of clusters of characteristics was done jointly. The case files in the two analyses were randomly equivalent. But, the actual coding of the two sets of cases was done by different individuals. The analysis of sample percentages that fell into different clusters was done separately (by computer, in the quantitative analysis). Only after both analyses were completed were the findings compared and the differences between them interpreted.

The proposition that emerged from both the quantitative and the qualitative analysis is this. Only a fraction of the population of pupils identified as PCD in Colorado have characteristics listed in the official or professional definitions of learning disabilities. The remainder of this population exhibits a variety of other characteristics. The numerical value of that fraction differs somewhat between the quantitative and qualitative analysis. We account for the discrepancies in the following paragraphs.

There were several highly consistent findings from the two analyses. The proportion of the qualitative analysis sample with "operational" definition of learning disabilities (achievement significantly below ability) almost exactly equalled the proportion of the quantitative analysis sample labeled "strict significant discrepancy". The "clinical LD" cluster in the qualitative analysis differed only by sampling error from the "high quality processing deficit". The "slow learner" cluster in the qualitative analysis included those who were similarly defined in the quantitative analysis plus those considered EMR. The sum of percentages of the two clusters equals the proportion of slow learners in the qualitative analysis. The incidence of hearing, vision, health, and brain injury was so low in the population that discrepancies in the two samples can be attributed to sampling error. In the qualitative analysis, cases with inadequate assessment data were ruled out of the clusters. This constituted 5% of the qualitative sample, marginally consistent with the quantitative sample.

The major sources of disagreement between the two methods were in the emotionally disturbed, language problem and miscellaneous clusters. Information on ethnicity or native language was missing from most of the cases but could be inferred by close examination of case histories. The close examination was more possible in the qualitative analysis than in the quantitative analysis. Language problems became a salient category only very late in this study, after we had discovered a set of children with Spanish surnames, depressed verbal abilities and language achievement, equivocal evidence of processing disorders, and histories of unsuccessful years spend in PCD programs. All these variables were considered jointly in the qualitative analysis, and the language problems cluster took precedence over other possible designations.

Information on emotional disturbance is very difficult to quantify, although it is readily apparent and persuasive in the narrative histories of PCD children. Data on processing disorders are already in numerical form and sometimes carry more weight than they deserve. Coders of the quantitative sample were extremely conservative in interpreting the presence of emotional disturbance. They decided on operational criteria for coding which gave the benefit of the doubt to clinicians' interpretations of marginal evidence of processing disorders. In this respect, the coders were behaving in a fashion similar to staffing committees, who seem reluctant to deal with emotional disturbance. Readers of the qualitative sample showed no such hesitation, but placed cases in that cluster whenever the data indicating psychological maladjustment was more persuasive than the data on processing disorders. The reader is encouraged to refer to Chapter 8 on the case histories.

The miscellaneous category in the qualitative analysis included normal children, children who were behind grade level but showed no real evidence of learning disabilities, those whose problems were "environmental" (as defined in the quantitative analysis), and many cases that no doubt would fall into the categories medium or weak discrepancy or processing deficit categories. It should be noted again that these latter categories were defined by extremely weak and unreliable indicators and give staffing committees great benefit of the doubt as to what characteristics validly constitute a learning disability. The qualitative analysis was not nearly so generous in this respect, so that many children with marginal evidence of PCD were classified as "miscellaneous."

8

CASE HISTORIES OF PERCEPTUAL/COMMUNICATIVE DISORDERED CHILDREN IN COLORADO

Mary Lee Smith

Obscured by the correlations, averages, and percentages listed in this report are living children and professionals faced with the demands, motives, histories, and constraints of today's schools. Neither statistics nor narration can bring these individuals to life, yet they should not be lost sight of entirely. We have included in this section ten case histories of children who have been placed in programs for Perceptual/Communicative Disorders (PCD) in Colorado. They are a subset of the probability sample of such cases selected to illustrate the typical range of cases.

For the reader to interpret the material in the case histories, it is necessary to know in common sense terms, the meaning of the clinical and statistical concepts as well as the assumptions used in the evaluation of a child suspected to suffer from a perceptual-communicative disorder (PCD).

Implicit in the evaluation files is the assumption of clinicians (those professionals who evaluate children referred to them) that intellectual functioning is the sum of a general intellectual ability plus a number of separate abilities. These separate abilities include memory, language, reasoning, perception -- visual, haptic and auditory -- and the cognitive integration or processing of perceptions; e.g. visual input with motor output. Clinicians expect a child's intellect to grow at the same rate in all of these respects. When the development of one ability is substantially at odds with the development of the rest of that child's abilities or inconsistent with his age, there is cause for alarm; the suspicion arisies that a disability of some sort exists. For example, if a child can reason very well and can remember words he hears but cannot learn words he sees on flashcards, the clinician might suspect that he is deficient in visual-perceptual ability, and thus have a learning disability.

This unevenness of the growth of abilities is typically judged either by observing the child's performance in the classroom or by administering batteries of tests. In evaluating a child for PCD many tests (or subtests on complex multi-trait tests) are given, each of which purports to measure either general intelligence or one or more of the separate intellectual or perceptual abilities. The idea is to look for discrepant scores on one or more of the tests (or subtests), with a low score on one test of an ability signaling a specific learning disorder.

When tests are used, however, the technology and standards of psychological testing must be considered. Psychometricians (experts in the theory and mathematics of testing) require that the difference between any two of a person's test scores be large enough to rule out randomness -- or chance -- as an explanation for the difference. If the difference is numerically large enough -- said to be "reliable," "significant" or "beyond chance" -- then one can make statements such as "Marilyn's memory is reliably worse than her language ability" or her "auditory perception is stronger than her visual perception." The simplest case of this "significance testing" is determining whether a child's achievement test scores are reliably lower than his general intelligence scores. This determination is embedded in the criteria for eligibility for PCD programs in Colorado and federal law.

Once the difference between two scores of separate intellectual abilities is determined to be greater than chance, a clinician may infer that the difference is due to some underlying neurological or perceptual disorder. Judging the validity of this inference rests on three conditions. First, a body of scientific evidence should link the symptom (the difference between two tested abilities) with the disorder. Second, several different clinicians evaluating the same child should be able to confirm the pattern of tested abilities.* Third, other possible causes of the observed symptom should be ruled out. For example, a highly anxious child might not be able to recite many digits in a digit span test and the resulting low score would therefore be due to an emotional problem rather than a deficiency in short-term memory. Or a child of average intelligence might have quite low reading achievement scores because he was absent a great deal or changed schools so that he lacked an opportunity to learn to read like other children of the same age.

The ten case histories that follow are real cases. They contain the essential details abstracted from ten special education files studied in the qualitative analysis. They also include sections labeled "analysis" in which we interpret the case and classify it according to the categories derived from the qualitative analysis. These are statistical significance of discrepancy, consistency, marginality of placement, necessity for special education, and cluster (implicit definition). These categories are explained in the Methods Section of the report.

Mike

Described by the school psychologist as "obviously a very bright boy who should be doing much better in his classwork," Mike was referred by his second grade teacher and placed in the program for perceptual-communicative disorders.

In evaluating Mike's health, the school nurse found no medical indicators of a handicap. The speech-language specialist found no auditory or language problems. The psychologist found indications of a learning disability in the numerical discrepancy between Mike's general intellectual ability and two of the subtests that make up the intelligence test. The Wechsler Intelligence Scale for Children (WISC-R) yields an estimate of general intellectual ability as a composite of several subtests. Clinicians frequently interpret the pattern of WISC-R subtests as indicative of separate intellectual and perceptual abilities. The subtests fall into a verbal group or a performance group and separate IQ scores are usually computed for each of these groups. Mike's overall

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*The Bender Visual Motor Gestalt Test and the Beery Test of Visual Motor Integration purport to measure the same ability and are frequently administered by the school psychologist and the PCD specialist, respectively. This condition of validity specifies that when a child's Bender score is significantly low, his Beery score should also be low.

IQ score was 108, a score higher than 73 percent of the general population (73rd percentile). The two low subtest scores measured short term memory and eye-hand coordination. Further evidence for learning disabilities was discovered in the form of reading achievement scores that were significantly lower than what one would expect based on his general intelligence. His reading grade equivalent score on the Wide Range Achievement Test was 2.2, or the level of achievement associated with the average child in the second month of the second grade. This score was lower than his actual grade placement of 2.7*. His spelling and arithmetic scores were within expectancy and at his actual grade level. Mike's performance on the Bender Visual Motor Gestalt test (Bender) led the psychologist to suspect that Mike had "from moderate to severe visual perception disabilities."

The special education teacher found similar results on achievement tests -- adequate performance in spelling and arithmetic and significantly low performance in reading. The Beery Test of Visual-Motor Integration (VMI) confirmed the results of the Bender. The Illinois Test of Psycholinguistic Abilities yielded no variation that the teacher could call significant, yet she interpreted weaknesses in auditory and visual memory as well as "grammatic closure." Like the other clinicians and Mike's classroom teacher, she noted that Mike was constantly in motion and failed to pay attention to the task at hand. The social worker described some mild forms of misbehavior and poor motivation on Mike's part. She described his family as "close-knit," with two sisters already in the PCD program.

ANALYSIS

The reason given for this placement was that a significant discrepancy existed between Mike's estimated intellectual potential and actual level of performance due to perceptual processing disorders. The discrepancy was statistically significant by our calculations, and the clinical pattern of test scores and behavior resembled what the professional literature identifies as a learning disability; that is, adequate potential for learning but impaired learning, erratic performance across time or different subjects, highly variable scores on tests that measure special intellectual or perceptual abilities, and persistent, pervasive inattentiveness, distractibility, and frustration in school. Although the clinicians were not altogether consistent with one another (auditory problems were found by the psychologist and special education teacher but not the speech language specialist) there was sufficient overlap to be confident that all of Mike's intellectual and perceptual abilities were not developing at the same rate. Alternative explanations could not reasonably account for the observed pattern. For example, there was no evidence of Mike's lack of opportunity to learn, no interference from a second language, his psychological adjustment seemed to be adequate, and no teaching problems were mentioned.

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*The significance of the discrepancy relates to the difference between IQ and achievement and not the number of months separating grade placement and grade equivalent achievement test score.

Kristen

By the third grade Kristen had been referred, evaluated, and staffed four times. During first and second grade she was placed in a program of speech correction. Based on the school's regular program of screening tests, she was found to be deficient both in articulation abilities and receptive and expressive language. At the end of the second grade she was referred for possible placement in the PCD program because her performance was below grade level in all subjects and she was said to have difficulty in following directions. At that time the staffing committee found no evidence for a perceptual or communicative disorder and instead recommended that she repeat grade two.

Kristen's parents moved her to a different school rather than have her be retained. In the new school, third grade, she was referred again for special education staffing. On the referral form her teacher wrote the following: "She has auditory discrimination difficulties. Her visual memory and comprehension is poor. She seems to have more ability than she projects. She is insecure and unsure of herself" (sic).

In the subsequent evaluation (by that time she was in the fourth grade) the psychologist found that Kristen's general intellectual ability was in the "dull-normal" range (IQ approximately 82, the 12th percentile), having "extreme difficulties with short term memory, absorbing knowledge from her environment, using abstract reasoning for problem solving, and non-verbal concept formation." On the Bender-Visual Motor Gestalt Test (a test that measures visual-motor perceptual abilities by having the child copy designs), Kristen functioned similar to a seven year old child. According to the psychologist, "While she is functioning approximately three years below her chronological age, she did not display those types of errors normally associated with serious perceptual problems. Instead they represent a developmental delay in this area."

Neither the social worker nor the nurse found evidence of a learning disability or emotional problem in their evaluations of Kristen. The speech-language specialist found deficiencies in auditory memory, reasoning, abstraction, comprehension, and expressive language.

The educational diagnostician gave Kristen tests of educational achievement and found her reading and math at the 4.2 and 4.4 grade levels, respectively. She was at that time in the sixth month of the fourth grade. These scores were interpreted as "definite academic deficiencies" and over-estimates of Kristen's day-to-day classroom work. All the clinicians agreed with the decision to place Kristen in the PCD program based on the discrepancy between her potential and performance, and her perceptual deficiencies.

ANALYSIS

Although Kristen was achieving below her grade level, a closer look shows that this achievement was actually above what one would predict from her general intellectual abilities. If any clinical term can be used to describe Kristen, it is "slow learner," a person whose general and separate, special intellectual and perceptual abilities are all approximately the same, below the average of the general population, but not so low as to be considered "retarded." In an urban or a poor rural school district, Kristen would probably not have attracted any attention. In some school districts, however, where the average socioeconomic level and pupil intellectual level is high, children like Kristen look discrepant from the norm and become candidates for special education. Kristen's teacher was familiar with the argot of learning disabilities, and the clinicians accepted her construction of Kristen's problems as perceptual. No confirmation of this construction was forthcoming from the clinical evaluations.

Sean

According to the school social worker, Sean was referred by his kindergarten teacher because of poor auditory and visual memory and general immaturity. In spite of the fact that he had already repeated kindergarten he would not listen or follow directions and was not developing learning readiness skills. The social worker, nurse, and speech-language specialist noted his behavior problems (bad temper and short attention span) and stuttering.

The psychologist was also aware of these problems. She administered the Wechsler Pre-school and Primary Test of Intelligence (WPPSI) and found Sean's intellectual abilities "at the upper end of the borderline range" (IQ approximately 78, the 7th percentile) but with significant differences between verbal and non-verbal portions and wide divergence among the subtests. For example, there were average scores on subtests that measure word knowledge, abstract reasoning and "visual interpretation of social situations," but very low scores on auditory memory, visual spatial orientation, assembly of abstract designs and visual-motor integration. This divergence of scores measuring separate abilities suggested serious learning disability, according to the psychologist. The results of the Bender-Visual Motor Gestalt Test, confirming some of the scores on the WPPSI, showed deficiency in visual-motor perception. Achievement testing on the Wide Range Achievement Tests placed Sean at the third month of kindergarten in reading and at the sixth month of kindergarten in arithmetic. His grade placement was the second month of kindergarten, but he had already been retained for a second year in that grade.

Tested by the special education teacher, Sean was labeled "high risk" by virtue of his score on the Evanston Early Identification Test, and deficient in auditory perception based on the Illinois Test of Psycholinguistic Ability, and the Wepman Auditory Discrimination Test. The Beery test of Visual-Motor Integration yielded scores that were equivalent to the typical youngster aged four and a half years. Based on an average score on the Peabody Picture Vocabulary Test, the special education teacher judged that Sean had good potential for learning but limited perceptual processing abilities.

The speech-language specialist found no auditory problems, but because of Sean's stuttering and deficiencies in receptive and expressive language, recommended speech therapy.

ANALYSIS

The staffing team placed Sean based on an "estimated discrepancy between potential and performance." However, the actual discrepancy was not statistically significant. Based on his rather low general intelligence score, Sean was performing at or above what one would expect. Results of the Bender and of the VMI could also be interpreted as those of a "slow learner." Nevertheless, the clinical pattern of perceptual disorder resembles what the professional literature defines as learning disabled. This was particularly true in the disparity between his vocabulary and abstract reasoning on the one hand, and his auditory perception and verbal expression on the other. Although it is difficult to unravel the effects of the low general intelligence from the effects of perceptual disabilities, in this case the benefit of the doubt must be given to confirm the judgment of the staffing team that Sean was learning disabled and needed the help of special education.

Marie

On Marie's "Individualized Educational Program" (IEP) under the heading "Basis for Determination of Handicap" the staffing committee wrote the following: "There is a significant processing disorder which results in at least a 30% discrepancy between assessed intellectual ability and current achievement levels, and there are persistent physical complaints related to stress and/or anxiety." This summary seems not to reflect much of the material in Marie's file. The most salient feature of the file is the number of statements made about her physical and mental health.

Two years before the staffing Marie was diagnosed as epileptic. Before that time there were no academic or behavioral problems at all, according to school records and her mother's report. After two years of petit mal seizures and medication, she was referred for staffing by her seventh-grade teacher. The words from the social worker's evaluation were as follows: disruptive behavior ... conflict between Marie and teacher ... low skills in math and reading, inability to follow directions ... wetting herself when under stress ... low maturity ... parents divorced ... poor self esteem ... resistive to authority, in psychotherapy.

The school psychologist relied on the intelligence test given by a private clinic, which placed Marie's intellectual level in the "low normal" region. He gave her the Wide Range Achievement Test which yielded reading and math achievement scores at the level of a beginning fifth grader. This was two years behind her grade placement. The Bender-Visual Motor Gestalt Test "was poorly executed and gives evidence of difficulty with visual-motor integration."

The speech-language specialist found Marie's language to be appropriate to her age, but her auditory memory was weak. The latter judgment was also made by the special education teacher who gave Marie the Detroit Tests of Learning Aptitude. This teacher reported that the test results could have been due either to inattentiveness or to learning disabilities. Further achievement testing was done, placing Marie in the third grade level proficiency in math and in the fourth grade in reading.

The staffing team placed Marie in the PCD resource room for two periods a day plus consultation with the specialist in emotional disturbance. Her primary instructional goal was to work on basic skills.

ANALYSIS.

Marie's educational and psychological test scores are markedly inconsistent from clinician to clinician. Even the lowest of her achievement tests (very different scores were obtained by the psychologist and the special education teacher) was not significantly lower than her general intellectual ability. Two clinicians found deficiencies in auditory abilities, but one of them questioned whether this low test score was not due to emotional problems. Epilepsy, eneuresis and the medication therefore seem to have produced severe problems of mental health for Marie, a condition which can deflate not only classroom performance but performance on tests as well. The hypothesis that the test discrepancies are due to learning disabilities seems to be much less justified. Certainly Marie needed both academic and emotional therapy; probably no perceptual disorder was involved. The staffing committee appeared to use the PCD program as a readily available instructional resource for anyone who needed it, rather than a program for children with perceptual or communicative disorders.

Juan

Juan's first grade teacher referred him for special education staffing because of inattentiveness, distractibility and what she called "difficulty with visual-motor skills." What she meant by the latter, in concrete terms, was that his handwriting was bad. This referral led to a complete evaluation by five different professionals. The social worker interviewed Juan's mother whose judgment of Juan was that he had no emotional, behavioral, or family problems. Concurring in this evaluation, the social worker recommended no "social work intervention." Also interviewed by the nurse, Juan's mother related his medical history, which revealed no medical problems. There was mention that two febrile seizures had occurred when Juan was 18 months old, but left unstated was the meaning ascribed to them.

The psychological evaluation covered four different tests spread over two days. From his performance on an intelligence test, the school psychologist inferred that Juan's cognitive functioning was in the high average range (IQ about 119, the 90th percentile) and found no evidence of differences in traits revealed in the pattern of subtest scores. No emotional problems were revealed on the projective test of personality. The psychologist found that Juan's visual-motor integration as measured by the Bender Visual Motor Gestalt Test (Bender) to be within the average range, but his human figure drawing "does suggest some lag in visual-motor development."

Several educational achievement tests were given by the special education teacher, and these unequivocally showed reading, math, and spelling achievement at a level commensurate with the average child beginning the second grade; that is three months ahead of his actual grade placement. Several perceptual tests were also administered. The Frostig Developmental Test of Visual Perception (DTVP) showed Juan's abilities considerably better than his age mates while his motor speed subtest on the Detroit Test of Learning Aptitude was slightly behind. The Beery Test of Visual Motor Integration (VMI) indicated a moderate lag in development.

Based on the judgments of the staffing team that Juan had a perceptual problem, he was placed in the Resource Room for remediation of a Perceptual/Communicative Disorder. His goals included a better record of completing academic tasks, ability to work independently, and improvement of visual-motor integration skills. Concerning the latter goal, Juan was supposed to "be able to correctly form and place upper and lower case letters of the alphabet on first grade lined writing paper ... accurately show a sentence from the chalkboard with correct spacing (and) show an improvement in his ability to copy designs."

Juan was reevaluated at the end of the year and retained for a second year in the resource room.

ANALYSIS.

There was no statistically significant discrepancy between Juan's potential and performance and no reliable evidence showing a perceptual disorder. The evaluation team relied on the teacher's definition of Juan's "problem" and test scores that weakly supported an inference of perceptual disorder even when the pattern of these scores was not reliable. They ignored test scores that would have disconfirmed this inference. For example, they relied on a slightly low score on the VMI in making their decision but ignored the average score on the Bender, which measures a similar ability. There was little consistency among the evaluators and the records fail to indicate whether or how they resolved or even noted this inconsistency. There is little in Juan's file to show that he has any handicap or that he needs help of any sort.

Johnny

When Johnny was in kindergarten he was evaluated for placement in the PCD program, but was not placed in it despite the findings and recommendations of the school staffing committee. The psychologist gave the Stanford Binet intelligence test which yielded an estimate of Johnny's intelligence in the "lower end of the dull normal range" (IQ about 80, 9th percentile) with little divergence of subtest scores of separate abilities. In spite of this relatively even pattern of abilities and Bender Visual Motor Gestalt Test scores appropriate to Johnny's age, the psychologist referred to him as a learning disabled youngster and recommended the PCD program to develop his auditory perception and language skills. The special education teacher found his achievement to be within acceptable limits, his Beery Test of Visual-Motor Integration age score to be near his chronological age and no significant weaknesses on the Illinois Test of Psycholinguistic Abilities. The classroom teacher stated that he missed school often, didn't respond to the teacher and did little or no work. The committee recommended the PCD program, citing a "significant discrepancy between estimated intellectual potential and actual level of functioning due to deficits in auditory memory." This decision was over-ruled by the district special education staff, however, when it determined that Johnny's achievement was what one would expect of someone with his level of intellectual ability. Therefore no handicap existed, they said, and Johnny should be helped in the regular classroom.

A year later Johnny was reevaluated, and this reason was given, "We are going to try again to get Special Education to take him for help." His intellectual abilities were not retested. The speech-language specialist noted that some Spanish was spoken in the home: "Although he understands Spanish he doesn't speak much." She found that his receptive and expressive language was somewhat behind his age level, auditory memory was normal but auditory discrimination was weak. The special education teacher found no significant deviations on the perceptual tests she gave, but serious problems in reading skills and ability to follow directions given orally. She noted that he did not participate in class activities, did not respond to adults, and annoyed other children in class.

On the basis of this information and the judgment by the committee that "a significant discrepancy exists between potential and performance," Johnny was placed in the resource room for 90 minutes daily. He was given help in reading, math, language and auditory training.

One year later, Johnny was referred again for evaluation, because he was making no progress in the PCD program. This time the psychologist gave him the Wechsler Intelligence Scale for Children (WISC-R) which measures general intellectual ability in two components -- verbal and performance. When measured with the performance component, Johnny's intellectual ability was in the average range (IQ about 90-110) but his verbal intellectual ability was in the borderline range (IQ about 60-80) although his auditory memory and abstract reasoning were average. He was weak in vocabulary, general information, and mentally solving arithmetic problems presented orally. The psychologist recommended Johnny's continuation in the PCD program based on "difficulty in the auditory area: vocabulary, nominal recall, and understanding longer complex sentences and directions."

ANALYSIS

Johnny met neither the operational criteria for PCD specified in the Colorado law (achievement significantly below intellectual potential) nor the clinical patterns suggested in the literature on learning disabilities (reliable variability in separate perceptual abilities or school performance). The original assessments suggested that Johnny might be a slow learner -- someone whose general and special abilities are all low and about the same and whose school achievement is at the level suggested by his intellectual abilities. Evidence on perceptual weaknesses was inconsistent from clinician to clinician.

The later evaluations provide another hypothesis. When Johnny's intellectual abilities were estimated with non-verbal measures, he appeared to be of average intelligence. But all tasks involving language, whether intelligence tests, reading achievement tests, or reading in the classroom, revealed poor performance. Some psychologists interpret a significant difference between WISC verbal and performance scores as indicative of a learning disability. Nevertheless, the more plausible hypothesis is that Johnny suffered in language-related activities from some condition related to his Spanish language heritage and home. This may be language interference or some other social or linguistic condition yet to be discovered. It is unlikely that "process training," which predominates in many PCD programs, would help him. Bilingual-bicultural education may be the answer. Intensive English may be the answer. The current state of knowledge does not yield definitive solutions to this problem.

Karen

"Why isn't Karen performing in the classroom?" This was the plaintive question written by the teacher on the school district form under "Reason for Referral." "She is bright," but "classroom progress doesn't seem to be as great as it should." She is "not able to put things down on paper." She is a "procrastinator in spelling." "Although she is a good reader, her written work is poor." She "has a short attention span ... it is hard for her to stick to tasks." Thus the evaluation for special education. The teacher wrote that Karen "is having a difficult time adjusting to school this year." Her performance has been low and the resulting psychological pressure is mounting.

The psychologist concurred in the teacher's assessment. He noted that she was frustrated by her academic failures, had begun to avoid her work, cried easily when she encountered failures and the resulting teasing from her classmates. Having an older sister who is successful at school had made her feel even worse. The psychologist gave Karen a test of general intelligence and confirmed that she was bright (IQ about 125, 95th percentile). Her reading achievement was within the range predicted by her general intelligence. Her arithmetic and spelling were significantly below what would be predicted, however. The psychologist found no evidence of perceptual disorders. The social worker also found that Karen's emotional problems were the result and not the cause of her learning problems.

The special education teacher recorded the erratic history of Karen's achievement test scores, varying from the 80th percentile in kindergarten to the 50th percentile in fourth grade. Her daily work in the classroom, particularly her written work had always been a problem. Based on the results of a half dozen tests, the special education teacher pieced together a complicated picture of Karen's educational performance. Her reading comprehension was good. She could work arithmetic problems in her head but failed on every task that required using paper and pencils to record answers or write sentences. Karen "does not know her math facts and must use her fingers to count ... she starts out to do a subtraction problem, then in the middle begins to add." No perceptual problems were discovered on the various tests. The speech-language specialist determined from four other tests that Karen exhibited "average to above average auditory perceptual skills and receptive/expressive language abilities."

The clinicians were in accord that Karen had a learning disability evidenced in her inconsistent rate of learning, persistent academic problems, inability to learn in a group situation ... problems with written language and math concepts." She was placed in the resource room and also given emotional help from the social worker. Her goals and activities in the resource room were specifically directed toward remediating her academic problems.

ANALYSIS

Karen's academic performance was significantly worse than her general intellectual ability in two areas. Although a specific disability was not diagnosed, the clinical pattern of erratic classroom performance and failure in written work was persuasive. One must always speculate about whether the obvious emotional problems are the result or the cause of the learning problems but in this case the chronology of evidence supports the former connection.

Karen needed the help of the PCD program and profited from it. By the eighth grade her achievement test scores had been raised to the level predicted by her general intelligence. She was retained for another year, however (this being for the academic year 1980-81) so that the need for further help from the PCD program was problematic.

Jim

The staffing responsible for Jim's current placement in PCD occurred when he was repeating the third grade. Counting kindergarten, he had been in three different schools in five years and his handicap had been redefined four times. He was originally staffed and placed in speech therapy while in kindergarten. Although the basis for the decision was his stuttering, the clinicians noticed emotional and family problems. While in first grade, Jim was evaluated and placed in the PCD program based on average intelligence test scores and scattered tests and subtest scores on the Illinois Test of Psycholinguistic Abilities, the Detroit Test of Learning Aptitude and the Wepman Auditory Discrimination Test. The special education teacher defined his problem as "perceptual" and his resource room program involved training those perceptual processing abilities that were considered weak. After one year in the PCD program he was evaluated as being in "severe need" although his Wide Range Achievement Test scores were 1.4, 1.7, and 2.4 (very nearly equivalent to his grade placement). When he moved into a different district, he was automatically placed into the PCD program. But reevaluation resulted in the clinical judgment that severe emotional and family conflicts were at the root of Jim's academic problems. The speech-language specialist found no perceptual difficulties. The special education teacher found him to be working at grade level in language arts and math and about a year behind in reading, this being influenced by auditory processing difficulties. The psychologist and social worker recommended psychotherapy. Words used to describe Jim included... social inappropriateness ... anxiety ... rage... manipulation... defy authority ... self-derogation and derogation of others ... poor self-concept ... inattention of father and powerlessness of mother.

After receiving therapy for a time, Jim and his parents moved again and he was evaluated and placed again in the PCD program. The speech-language specialist found auditory difficulties. The psychologist found no perceptual problems and recommended psychotherapy. The special education teacher found no evidence of perceptual problems but very poor academic performance (the Wide Range Achievement Test grade equivalent scores were 1.4 for reading and 2.2 for arithmetic).

Besides his academic goals ("Jim will master his reading vocabulary with 90% accuracy"), Jim's current objectives in the PCD program, inexplicably, include the following "improve eye-hand coordination," "improve posture both standing and walking" (e.g. "When walking Jim will hold body in proper verticle alignment, using a smooth heel-toe gait and relaxed alternative arm swing observed 70% of the time"), "improve in balance skills," and "improve the level of physical fitness."

ANALYSIS.

By the third grade Jim's achievement was reliably lower than his intellectual ability. The evidence that suggests Jim's handicap as emotional is much more compelling than any of the conflicting evidence about perceptual or processing problems. The most striking thing about this case, however, is that the nature of Jim's problem was redefined each time he changed schools. With each redefinition the program of remediation changed as well, varying from "rage reduction" to "posture improvement."

Scott

Scott was originally referred for special education staffing while ten years old and in the fourth grade. His teacher noted that he could not keep up with the class in reading and was having problems "putting letters together."

The psychologist administered the Wechsler Intelligence Scale for Children (WISC-R) and found Scott's IQ to be 100, right at the average of the general population. There was a difference between his verbal- and performance-assessed intelligence, with the verbal IQ much lower. On the advice of the teacher, the psychologist administered the Jordan Left-Right Reversal Test and found Scott's score to be more like a typical seven year old. This test indicated a lack of ability to recognize when letters or numbers are printed correctly. The Wide Range Achievement Test showed that Scott was performing in reading similar to the average child at the end of the third grade and in arithmetic like the average child beginning the third grade. His grade placement at that time was the third month of the fourth grade. The special education teacher gave the Developmental Test of Visual-Motor Integration and found Scott's visual perception similar to the average seven year old. The decision to place Scott in the PCD program to remediate his visual perception and academic problems was unanimous.

In the resource room Scott worked on the Frostig materials to correct his visual perception problems. By the end of fourth grade, all of his objectives had been met so that he was discontinued from the PCD program.

In the sixth grade he was tested again as part of a re-evaluation of all former special education students. The psychologist was the only person to evaluate him. The WISC-R scores were the same as recorded two years earlier, with weaknesses again noted in the verbal area. Visual perception, however, was now interpreted as a strength (no doubt the result of his experience with the Frostig materials). His achievement was at the appropriate grade level in reading, about a year below in math and two years below (equivalent to a beginning fourth grader) in spelling. The latter score confirmed the report of Scott's teacher who said he had extreme difficulty writing down his responses, often reversed letters and numbers, and failed to express his full amount of knowledge.

The staffing committee agreed that he should be placed in the PCD program based on the difficulties with oral and written expression.

ANALYSIS

Scott had average ability and achievement significantly lower than what one would expect. Thus he qualified for the PCD program by virtue of the operational definition specified in state guidelines. The evidence of perceptual problems was reliable and consistent across clinicians and tests. He needed help, received the kind of treatment indicated in the evaluations, and profited from it. The team of clinicians did not belabor the process of evaluation, gave only those tests that were suggested by the referral problem, and emphasized the concrete details of what Scott could and could not do.

Rudy

Rudy is a Spanish-surnamed boy who was evaluated and placed in the PCD program while in the third grade and remains there three years later. No reason was given for his referral because he transferred in from another school district in which he had also been in the PCD program. Besides the resource room he had been and continued in speech therapy and bilingual-bicultural education.

The psychologist noted that English was the language spoken in the home although Rudy's father spoke some Spanish. The test of general intelligence given by the psychologist yielded an IQ of approximately 90, but pronounced differences were found between the verbal and performance parts of the test. The verbal score was in the low average range (about 88, the 21st percentile) while the performance score was in the upper part of the average range (IQ about 105, the 63rd percentile). According to the psychologist, this difference indicated a serious learning disability. He was weak in auditory memory and arithmetic reasoning. On the Wide Range Achievement Test, Rudy was reading at the upper first grade level, and his arithmetic skills were at the beginning second grade level. His performance on the Bender Visual Motor Gestalt Test showed no "significant lags in visual-motor perception skills." The psychologist recommended that Rudy remain in the PCD program based on his "serious learning disability" and be given the program called Auditory Discrimination in Depth to deal with his auditory problem.

The achievement tests given by the special education teacher showed rather a different picture than those given by the psychologist. The Woodcock-Johnson reading test placed Rudy at the middle of the second grade, and the Key math test showed his math achievement to be right at grade level. The Beery Test of Visual-Motor Integration (VMI) showed that Rudy's visual-motor perception was equivalent to that of a child one year older than he. His auditory discrimination scores on the Wepman Auditory Discrimination Test were appropriate for his age level. The special education teacher interpreted the results this way, "he has made alot of accommodations in the fine motor areas but the visual perceptual area from observation during testing needs much work."

The speech-language specialist did not test for auditory perception, but found Rudy's receptive language abilities below par and therefore recommended speech correction. No clinician mentioned any behavior problems. All recommended placement in the PCD program for remediation of his perceptual problems. The staffing summary read, "There is a significant discrepancy between estimated intellectual potential and actual level of performance manifested in disorders in math, reading, and language due to auditory and visual processing."

After three years in the program Rudy was still reading and spelling at a level equivalent to a beginning third grader. His math achievement was equivalent to the average child beginning the fifth grade.

ANALYSIS

Looking across the test scores and judgments of the clinicians and the progress over the three years one must suspect that Rudy was misplaced in the PCD program. First, there was no statistically significant discrepancy between his general intelligence (as measured by the full intelligence test) and his performance on tests of educational achievement. Second, there was no credible evidence for the existence of a perceptual disorder. The various clinicians were extremely inconsistent in their scores and interpretations. Although many psychologists interpret a discrepancy between the verbal and performance sections of the WISC-R as indicative of a learning disability, many alternative explanations can be posed. Third, the PCD program based as it was on remediating perceptual disorders, failed to help Rudy in language skills. Rudy is bright enough, when intelligence is measured in ways unrelated to the English language but deficient in all tasks (both those on tests and those in the classroom) requiring use of the English language. Perhaps it is reasonable to hypothesize that, rather than a perceptual disability, Rudy's problems have some connection with language interference* or some other cause related to his Spanish language background. The tragedy is that bilingual-bicultural education also failed to help him.

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*Some might argue that what we are calling language interference here is synonymous with a communication disorder and hence a legitimate learning disability. We disagree because the meaning of "handicap" and "communicative disorder" still implies an intrinsic dysfunction in how the child is processing information. This is not necessarily true; language interference problems like those implied in this case are more plausibly environmentally or situationally induced. Furthermore the consequences of misconstruing the source of the problem are serious because: 1. As in Rudy's case, even if the placement is defended because of a communicative problem, the treatment is still inappropriate for perceptual disorders, and 2. A handicapped label, even a less stigmatizing one, is potentially more serious for minority children.

9

COSTS

The costs and benefits of educational programs are difficult to measure. Some are so intangible that they cannot be quantified. In this chapter, we attempt to estimate the costs of assessment and staffing by relating the investment of professional time involved to average salaries. These costs are then compared with typical costs of special instruction and services. The reader must weigh by himself the costs against the benefits of assessment and staffing.

In Table 9.1 median salaries are reported for five categories of specialists in three sampled districts or BOCS: one rural, one metropolitan and one suburban. An average of the median salaries was used to calculate hourly wages for principals, psychologists, speech-language specialists, PCD teachers, and social workers who routinely participate in the identification process. The average wage for PCD teachers was also used for nurses. These rates are used in computing the itemized bill in Table 9.2.

The referrel, assessment and staffing process is summarized in Table 9.2. Although the sequence varies across districts and sometimes with particular children, the identification process generally includes some consultation among special education specialists and the classroom teacher. There is usually a mini-staffing or pre-assessment conference. Frequently, there are additional brief consultations among professionals or between professionals and parents which we have not included. The number of tests and number of professional meetings are estimated for the typical child. These estimates are conservative since they are based on examination of pupil files. The time it takes to administer standardized tests is presented in round figures and includes informal activities such as establishing rapport with a child

Table 9.1

Median Salaries and Cost/Hour For Professionals
Involved in the Identification of PCD Pupils
In Three Sampled Special Education Units

		Principals	Psychologists	Speech/ Language Spec.	PCD Teachers	Social Workers
DISTRICT	1.	$31,000	$26,025	$24,183	$24,183	$24,937
	2.	$25,985	$16,200	$15,493	$14,756	$14,040
	3.	$28,795	$21,223	$17,601	$14,332	$13,781
Average Median Salary		$28,593	$21,149	$17,601	$17,757	$17,586
Cost/Hour		$21,18	$15.67	$13.04	$13.15	$13.03

Table 9.2

Analysis of Referral, Assessment and Staffing Costs
In the Identification of the Typical PCD Pupil
Based on Averages From Pupil Files
And Median Salaries

Stage in the Identification Process	Hours	Cost
Referral		
Most often children are referred by the classroom teacher.	1 teacher	$13.15
10% of the time this involves a meeting between the teacher and parent.	.1 teacher	1.32
Increasingly, specialists provide consultation to the classroom teacher before full-scale assessment is undertaken.	1 teacher 1 PCD teacher 1 psychologist	13.15 13.15 15.67
Districts have established procedures to decide who will participate in assessment; it usually involves a brief meeting.	.5 principal .5 PCD teacher .5 psychologist .5 regular teacher	10.59 6.58 7.84 6.58
	Subtotal:	$88.03
Assessment		
The typical PCD child is administered 6.6 tests (see Table 5.2); we used 6 tests because occasionally assessment is not completed for children eventually not placed in PCD.		
The tests and informal assessments usually involve at least the following:		
Psychologists		109.60
3 tests	3	
informal observation	2	
report	2	
PCD Teacher		78.90
2 tests	2	
classroom observation & consultation	3	
report	1	
Speech Teacher		65.20
1 test	1	
informal measures	3	
report	1	
Nurse		39.09
visit with parents & medical history	2	
vision and hearing	1	
Social Worker		52.12
home visit and report	4	
Staffing Meeting		
6 professionals for a 50 minute meeting (a parent is usually also present)	6	92.00
	Total:	$ 525.03

before giving a test. Again these are underestimates, because they do not include ordinary goings and comings and time spent in scheduling all of the meetings with the child and among the staff. Furthermore, we have not included overhead costs, the time spent in preparing reports after the staffing, clerks' time for ordering tests and typing reports, review of placements in the central office, or travel of professionals to parents homes and to the staffing meetings. These estimates might raise the final figure by as much as 25-33%. No cost of parents' time in included.

The dollar amounts reported in Table 9.2 are simply the wages computed in Table 9.1 assigned to the hours recorded in the assessment and staffing sequence. The total cost is $525 to identify a child as PCD. To check the accuracy of this cost estimate an entirely different source of cost data was used. The dollar figures attributable to assessment and staffing of PCD pupils were derived from personnel reports submitted to CDE from individual units. In addition to the dollars and FTE claimed for reimbursement, each person reported what percent of their special education assignment was spent in screening, testing, assessment and staffing. These figures were increased by a fraction of the time spent in consulting, writing reports and travel that could also be attributed to the identification process. Then, the percents were scaled down to represent only PCD pupils rather than all handicapped pupils. In 1978-79, a conservative estimate of the personnel costs to assess and staff potential PCD pupils was $6.58 million. This does not include the personnel time for specialists like occupational therapists who are not routinely present at staffings for PCD pupils. It does not include overhead or fringe benefits. For example, if the time of special education secretaries attributable to assessments and staffings was added, the figure would increase by $150,000. If the total cost of assessment and staffing for potential PCD pupils is divided only by the number of PCD pupils placed in 1978-79 the cost per pupil is $611. If however, the cost is spread over both those staffed and not placed as well as those placed in PCD, the cost is estimated to be $505 per pupil. Because these estimates are so similar to those in Table 9.2 and were arrived at from independent data, both estimates are believable.

The implications of the cost ($505 to $525) of identifying a child as PCD are clearer when it is compared to other educational expenses. For example, in 1978-79, the per student special education cost reported for PCD pupils was $1,204 (CDE, 1980, Table XXVII). These figures cannot be compared directly, however; first, the $1,204 includes support costs such as supplies and transportation (actual mileage not just personnel time in traveling) and the $505 does not; second, the $1,204 includes the assessment and staffing costs to which it is being compared.

For 1978-79, the total dollars reported for direct personnel services (both instruction and other direct services) to PCD pupils was $13,270,054. This includes instruction provided by all types of specialist teachers to PCD pupils, it also includes direct services from support personnel including psychologists, social workers, occupational therapists and secretaries. Averaged over 24,451 PCD pupils, the cost per pupil was $543. By this comparison the cost of personnel time devoted to the assessment and staffing process is roughly equal to the cost of personnel time spent in providing direct services to PCD children. If we subtract out the average cost per pupil for non-personnel cost, $70, the remainder $86 per pupil is attributable to the time of various specialists spent in consulting, planning, traveling and reporting activities in support of instruction. Thus the cost of assessing and staffing one PCD pupil (with accompanying support costs) should be thought of as just less than the cost of one year's direct instruction and services (with accompanying support costs).

Of course, it must be remembered that the costs of initial PCD identification are a one-time expense. Once children are placed they are likely to receive more than one year of service (in 1978-79, 62% of the PCD children had been served previously). The comparison to the cost of direct services only helps to establish the value of what this dollar amount could purchase. As will be discussed in Chapter 10, the issue is not whether to promote cheap assessments but whether the benefits are sufficient to offset the costs for marginally placed pupils.

For some of the children described in Chapters 7 and 8, those who are slow learners or below grade level in academic performance, it is relevant to compare the expense of identifying the child as handicapped with the cost of remedial tutoring. If a certified teacher provided one-to-one instruction in the deficient academic subject or basic skill, $525 would buy 40 hours of tutoring, or 3 hours per week for 13 weeks (one-third of the school year). If an aide were paid for one-to-one tutoring, 105 hours could be purchased: one hour per day for six months.

Although it is true that initial placements are a one-time cost and that most students are retained in special education, it is also true that the entire system is heavily invested in the identification process largely because of pupil mobility and the large number of referrals every year. An index of this mobility is that approximately 75% of PCD pupils are retained at the end of the year but only 60% actually return. As a consequence it is possible for both of the following facts to be true although they seem mutually contradictory: the number of PCD pupils staffed and placed for the first time in any one year is equal to one-third to one-half of all the PCD pupils served that year; and the majority of PCD pupils, two-thirds to three-quarters, have a history in special education longer than two years.

Table 9.2 provides a summary of professional time spent. It also reflects the time the child is involved in the assessment process. The average PCD child takes seven formal tests, produces as many informal work samples, writing tasks or language samples, is interviewed by five professionals, and receives a medical examination, for a total of 21 hours. If intensive instruction only occurs in the regular classroom for two hours per day, this could be equivalent to missing two weeks of school.* The emotional impact of these assessments is impossible to assess. The tests are administered by trained professionals who are sensitive to the child's anxiety and fears of tests. But nonetheless, there is the need to administer tests to children who may already have a sense of failure. The child's sense of a new beginning and belief that help will come at the end of this process-- a feeling usually felt more strongly by the parents--may well be overshadowed by the sense of being different and incompetent.

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*The most extensive classroom observation study extant, published by Far West Laboratory of Educational Research and Development showed that the actual number of hours the typical elementary school pupil is "engaged" in reading instruction is only 70 hours a year.

The primary benefit of the identification process is that the child is ultimately placed in a program where he will receive special help. Some of the costs toward this end could be deducted if they were themselves a benefit. For example, if the consultations or assessments that occur as part of the identification procedures provide insight into the nature of the child's problem, then the professional time spent has already paid for itself. For those pupils who are referred and not assessed, or assessed but not staffed, some may have had their problem ameliorated or even solved by the interaction of specialists and the classroom teacher. In 1978-79, only about half of the pupils who were referred were eventually placed in PCD. For these, the immediate benefit of the assessment procedures is not discernable except in the benefit of placement. This is especially true since an implict definition of PCD is that nothing else has worked, e.g., the psychologists may have made suggestions to the classroom teacher but the problem has not be alleviated.

It is possible to argue that the cost of the identification process should be partially discounted because the assessments served two purposes: both to identify a child as PCD and to plan subsequent intervention strategies. Our findings suggest that while ideally this should often be the case, for the majority of cases, it is not true in practice. Three-quarters of all PCD teachers report that they give a new set of tests to direct instruction after a child has been placed. Many norm-reference measures which are appropriate for identifying the severity of a child's handicap do not provide information for instructional prescriptions. Teachers generally follow-up with more detailed criterion-referenced tests or informal work samples to identify the particular tasks with which a child is having difficulty. For example, while the Woodcock Reading test can be used for both identification and instructional planning the WRAT has limited utility for identification and is of no use whatsoever in planning interventions because it has so few items at each skill level.

When tests with poor validity and reliability are administered, it is difficult to estimate their utility either for identification or remediation.

Some clinicians may give a test like the ITPA knowing it has poor validity and unreliable subtests just to watch a child's behavior rather than to obtain an interpretable score. However, the 35% of PCD teachers who said the ITPA has adequate reliability are not likely to be so cautious. In our intensive study of cases we saw many instances where unreliable subtests were interpreted without any other confirming evidence. Unless these were followed by additional assessments whether formal or informal both the diagnosis of handicap and the instructional program are likely to be misdirected. Because the use of tests for instructional planning was not one of the variables coded in the case analysis, we cannot be as systematic in responding to this issue as we can be for other issues. Our impression is that generally it was only the PCD teachers' assessment time which had direct payoff for subsequent instruction, and then only about one-third of the time. (Speech teachers' assessements were usually relevant to later intervention in speech if the child was also assigned to speech services.) Based on the cost estimates in Table 9.2 this could be treated as a dividend of $37. That is, of the original $525 cost for identification, this amount has additional benefits for instructional planning.

Summary

Cost data used in two separate estimation procedures indicate that the typical cost in personnel time for referring, assessing, staffing and placing a PCD pupil for the first time is $505 or $525. This is almost equal to the personnel costs for direct special education instructional and support services to the average PCD pupil in 78-79.

Some benefits accrue from assessment and identification apart from placement of pupils in special education. Often pupils who were referred but not subsequently assessed and staffed may have received help from the consultation of specialists with their classroom teacher. Assessments, especially those done by the PCD teacher, may guide subsequent instruction for pupils placed in PCD as well as contribute to the identification of the handicap. Unfortunately this type of joint benefit was observed in only about one-third of the cases and therefore does not substantially reduce the real costs of the identification procedures.

10

FINDINGS AND RELATED ISSUES

In this chapter, key findings from previous chapters are restated. Additional findings which are not directly about the PCD identification process but which are relevant to providing services to PCD children are also presented. Finally, the policy implications of the findings are discussed.

Characteristics of PCD Pupils

The single most important finding is that more than half of the children currently placed in PCD in Colorado do not meet either statistical or valid clinical criteria for the identification of perceptual and communicative disorders. Some (10%) have other identifiable handicaps, many others have serious problems in school--because they are dominant in a language other than English, or have missed a month of school every year, or have low intellectual ability--but they do not have any reliable signs of a learning disability.

The analyses leading to this conclusion are described in detail in Chapter 7. Results were cross-validated using quantitative and qualitative methods. The quantitative analysis was governed by a "benefit-of-the-doubt" rule, i.e., cases were placed in "true PCD" categories if they had any sign of the disorder and in other categories only if they had none of the PCD indicators.

The results of the quantitative analysis appear in Tables 7.7 and 7.8. The population of PCD pupils served in Colorado in 1979-80 can be broken down into these major subgroups: 10% have other handicaps (EMR, Emotionally Disturbed or Hearing Handicapped), 41% are "true PCD", i.e. they have either strict or weak signs of perceptual or communicative disorders (26% and 15%, respectively), 24% have other learning problems (language interference, slow learners, and below grade level without a significant discrepancy), 6% have minor behavior problems or are hyperactive, 17% could not be classified either because they were missing both IQ and achievement tests and had no valid evidence of a processing disorder (6%) or because the data did not fit the criteria for any of the previous categories (11%). The results of the qualitative analysis parallel those above with some exceptions. Because the qualitative analysis did not follow the "benefit-of-the-doubt" rule, it would suggest substantially larger numbers in the emotionally disturbed and language interference subgroups and fewer validly placed PCD cases.

Definition

The conceptual basis for both the Colorado definition of PCD and the federal definition of specific learning disabilities is explained in Chapter 3. The essential elements in the definition are a significant discrepancy between intellectual ability and achievement, and inferred dysfunction in one or more of the basic psychological or learning processes, and an exclusion (i.e., ruling out) of other known causes of learning difficulties such as mental retardation, visual or hearing handicaps, emotional disturbance, or cultural deprivation.

Although the current definitions are "state-of-the-art" definitions, they convey a conceptual understanding rather than concrete identification guidelines. Furthermore, the criteria which were distributed to districts in a sample comprehensive plan and adopted by numerous units are inadequate; they introduce without rationale an absolute as well as relative model of discrepancy, they adopt an age-norm comparison for interpreting processing deficits which contradicts the discrepancy component in the PCD definition, and they give carte blanche to clinical judgment as the sole basis for determining that a handicap exists without imposing any standards for consistency of diagnoses.

The results of the survey reflected considerable variability in the views of professionals regarding the definition of PCD and the importance of different indicators in identification. Specialists generally subscribed to an ability/achievement discrepancy as a key indicator. They were in serious disagreement, however, on whether evidence of linguistic differences or socio-economic differences should contribute toward a diagnosis of PCD or contribute to ruling it out.

Dismissal from PCD Programs

The percent of PCD pupils who are dismissed at the end of the school year with their objectives accomplished has decreased from 20% in 1974-75 to 11% in 1978-79 (CDE, 1980, Table VII). The projected percent for 1979-80 is 10%. Although there is attrition from the program for other reasons, such as leaving school or leaving the district, the general rule is that children who are placed in PCD tend to stay in the category for at least one year beyond the initial year. One expects a high retention rate in handicapped programs for the most severely disordered pupils. However, the dismissal rate should be commensurately higher for mildly affected children and for those who were perhaps misidentified in the first place. Therefore, the small dismissal rate for PCD is surprising considering the much higher percentages of marginal placements identified by both the quantitative and qualitative analyses in Chapter 7. We offer the following conjecture about why this may occur: since nearly all PCD pupils were originally referred because of a problem in the regular classroom, the PCD teacher will invariably have something to work on with each child even when his disability is corrected. Only in a small percent of cases, 4.5%, did the initial staffing committee express some doubt about the determination of a PCD handicap and suggest that the placement be reevaluated in six months or a year to determine the accuracy of the PCD designation. Therefore, most of the time teachers concentrate on meeting a child's educational needs and do not reconsider the validity of the original handicap diagnosis.

In interviews, several directors identified exit criteria for staffing a child out of PCD that are not congruent with entrance criteria. The difference in criteria for dismissal from PCD was reflected by two recurring types of statement: 1) greater emphasis is given to the opinions of the classroom teacher, PCD teacher and parents who have greater opportunity to observe how the child is doing and 2) the criterion is either that "the problem that interferred has been ameliorated or compensaotry skills have been achieved." These same considerations were noted in the principals' questionnaires. The orientation reported for most end-of-year staffings was not "does this child presently meet criteria for identification as PCD?" but rather, "given that the child is PCD, does he have sufficient survival skills to require no more special assistance?"

PCD teachers who have the most to say about dismissal from PCD, report that they use numerous indicators for such a recommendation including elimination of discrepancy, academic performance brought up to grade level, attainment of IEP goals and reduction of processing deficits. The single most important factor, with the highest percentages of PCD teachers calling it critical or important, was their own judgment about a child's ability to function in the regular classroom without further help.

The dismissal and retention statistics suggest that is is easier to get into PCD than to get out. Because evaluation of dismissal decisions was not the focus of the study we do not have data about the amount of assessment done to reevaluate the existence of a handicap. Based on directors' reports it appears that exit from PCD is more likely to be determined by the teacher's judgment that the child's "inability to function in the regular classroom" has been alleviated. For initial identification criteria, however, the majority of professionals surveyed rejected "inability to function in the regular classroom as a primary indicator of PCD." Based only on the numbers and this difference in criteria it appears that the trend is to serve PCD children past the point where they would qualify for placement if reevaluated for PCD.

Prevalence

The percent of PCD pupils (out of all children enrolled in school) has increased from 4.2% in 1975-76 to 5.1% in 1979-80, an increase of 21%. That increase is not likely to be due to demographic changes in the state since such changes would also affect other categories of handicap. Instead PCD has grown as a percent of all handicaps from 36.7% to 46.7% over the same time period.

Special education units throughout the state vary widely in the percent of their enrollments identified as PCD, from 2.11% to 8.56% in 1979-80. In Chapter 4 it was suggested that the variability in the percents among units and across years can be interpreted in one of two ways. Either there are true differences in the incidence of the disability or the differences are due to local policies and practices that systematically and arbitrarily produce varying rates of identification. In Appendix E, Ysseldyke provides references of national studies which support the second conclusion.

Tests and Test Interpretation

In Chapter 5, the formal tests most often used in the identification of PCD pupils were reported. Reviews from the professional literature were presented for the eighteen most frequently used measures. Most of the measures did not meet minimal technical criteria for reliability, validity, and appropriateness of norms. A serious concomitant problem is that between 30% and 50% of professionals were unaware of the inadequate reliability and validity of some of the tests they use often.

The solution to this problem for achievement and IQ tests is different from that for measures of processing deficit. For assessment of achievement and IQ there are tests with strong psychometric properties (e.g., the Woodcock Reading Test and the WISC-R); current practice is inadequate because often tests with poor validity are used instead of good ones or because pupil time and resources were wasted by giving poor measures in addition to the technically adequate ones. For the assessment of processing deficits, the inadequacy of tests is more pervasive; there are no highly valid and reliable measures of processing abilities.

Chapter 5 also includes standards for interpreting patterns of test score results, e.g., significant discrepancies, subtest scatter and processing deficits. A major finding of the study is that many clinicians are not sufficiently knowledgeable about test score patterns of normal children to realize that many of the signs, which clinicians interpret as indicators of PCD, are in fact normal. Only half of the PCD teachers could identify a significant discrepancy in a sample problem.

Finally in Chapter 5, a model for clinical judgment is presented and its strengths and weaknesses evaluated. Clinical judgment is an attractive alternative when so many formal tests are inadequate and when no one statistical formula accurately reflects all of the aspects of diagnosis. The reason our conclusion in Chapter 5 is so pessimistic about the validity of clinical judgments as currently practical is that only a small proportion of clinicians showed that they understand the principles of clinical hypothesis testing and confirmation. As part of the analysis of pupil files explained in Chapter 7, ratings were done of the consistency of clinicians' interpretations of processing deficits and of the congruence between these diagnoses and the stated basis for determination of a handicap. Minimal standards for consistency and confirmation were met in only a small proportion of cases.

Nonhandicapped Children with Special Needs

This study has found that half of the children currently placed as PCD do not qualify by any definition of handicap. The most serious issue to be considered in response to this finding is that many of the "nonhandicapped" children have serious problems in school and need special help. This is especially true for pupils in the language interference group. Because they are ethnic minorities, it is especially important that they not be called handicapped when they are not. However, they may lag seriously behind in school because their first language is not English or because they have trouble adapting to the mores of the school. Similarly, children who come from poor homes and who miss more than a month of school per year (classified in the environmental problem group) have enormous academic problems. Many of the children we identified as slow learners, whose IQs are in the range from 70 to 89 (without signs of PCD), were thought to have difficulty learning in school even when their progress is entirely consistent with their potential.

Much anecdotal information indicates that staffing committees classify as handicapped children of these types. They are not handicapped, yet they need extra attention, and there is currently no way to provide it other than labeling the child PCD.

Removing Problem Children from the Regular Classroom

In the previous section we described a commendable motive for over-identifying pupils in PCD; i.e., to provide special education to children with severe needs. A less commendable motive can also be described for misidentification, namely, removing troublesome and hard to teach children from the regular classroom. Some of the PCD cases who did not have any of the indicators of PCD and did not qualify for other handicapped subgroups (see Chapter 7) were actually above grade level on nationally normed tests. Some of these had minor behavior problems as their only abnormal characteristic. Some had complete files but not a single indicator of PCD or other learning or behavior problem.

Coles (1978) proposed a radical thesis that labeling a child learning disabled is a way of blaming children for what is actually the failure of schools to provide adequate education for all. For the 20-25% of PCD cases who have no signs of a handicap or who are not seriously below grade level, it is more reasonable to propose that the disorder is in the school environment rather than in the child. However, in the qualitative analysis "teaching problems" were mentioned by specialists in less that 1% of the cases as a possible source of the problem. We did not have the opportunity to observe the characteristics of children who were referred but not placed in PCD. It is possible that some of these cases were treated by making adaptations in the regular classroom. A few districts have built into their identification process the requirement that alternatives be tried before special education placement. Nevertheless, the sizeable number of PCD cases without signs either of PCD or of other serious learning problems, suggests that the question of problems in the school setting itself is not raised often enough.

Appropriateness of Interventions Provided to PCD Pupils

The present study was focused on the identification of PCD children and was not designed to test the effectiveness of educational programs provided to them. Nevertheless, an ingredient in evaluating the identification process is not only whether the designations of handicap are valid but also whether placement decisions match the needs of children with appropriate instructional interventions. One of the research questions posed was, "once identified, are PCD children provided with interventions that can be supported by current research evidence?"

To answer this question one must consider both the range of instructional strategies used by PCD teachers and the range of characteristics of children placed as PCD. In chapter 6, data were reported for how PCD teachers spend their direct services time with PCD pupils.

On average between 30% and 35% of the time is spent on repetition and drill on basic skills and between 15% and 18% of time is spent in one-to-one tutoring with regular classroom work. Therefore roughly half of the special instructional time for PCD pupils is spent directly on academic work. Logically, one-to-one instruction is more beneficial than a corresponding amount of time spent in the regular classroom with larger groups of pupils and perhaps inappropriate level of material. Therefore, when the special education services are direct help with academic subjects the treatments are presumed to be effective. Moreover, academic tutoring is expected to be a learning help regardless of whether the child is truly learning disabled or a slow learner or emotionally disturbed.

The type of PCD intervention which lacks research support is "process training" whereby efforts are made to strengthen or remediate an underlying processing deficit. In an extensive review of research, Arter and Jenkins (1979) integrated the findings of more than 100 studies on the effectiveness of psychological process training. Their summary was as follows:

> There have been many attempts to train specific abilities. Psycholinguistic, visual perceptual, auditory perceptual, and motor abilities have all been the focus of training. The training itself has been based on various theoretical positions related to the ITPA, Peabody Language Kits, Doman-Delacato Methods, Kephart-Getman programs, the Frostig-Horne program, and a number of miscellaneous perceptual motor programs. Ability training succeeded about 24% of the time in well designed investigations. It is difficult to escape the conclusion that abilities measured in differential diagnosis are highly resistant to training by existing procedures.
>
> Given this, it would certainly be surprising to find that ability training improved academic performance. Indeed, the research shows that more often than not academic performance is not improved. Excluding studies designated as poorly designed, ability-trained groups outperformed untrained controls on roughly one-third of the academic measures taken. In the majority of studies, control groups performed as well on both ability and academic measures as did the experimental groups. (p. 547)

Because the research findings suggest that ability training is ineffective more often than not, it is questionable whether this type of program should ever be recommended since it diverts attention and effort from direct work on academic skills.

PCD teachers surveyed reported that they spent between 10% and 16% of their instructional time providing "direct training of psychological processes such as visual discrimination, auditory memory and attention." An additional 10% to 17% of time was spent in process training using materials adapted from regular classroom work. To the extent that the latter activities provide direct skill instruction, they are more defensible than instructional efforts aimed solely at underlying processes. Nevertheless 20% or more of special instructional time provided to PCD pupils is spent in activities the effectiveness of which is in serious doubt. This mode of intervention is especially questionable for PCD pupils who are mislabeled, those with emotional disorders, second language problems, or environmental problems.

The IEP objectives in individual pupil files give some idea whether children who are called PCD but have other serious problems receive help tailored to their particular needs. For example, of the children we identified as emotionally disturbed in the quantitative analysis, only 20% had received either psychological or social work services. Since the criteria for including children in this category were stringent, requiring strong evidence from more than one clinician, this implies that children with fairly pronounced emotional needs did not receive relevant treatment, either because they were misdiagnosed or no treatment was available for remediating emotional disorders.

Similarly there was little evidence that children in the language interference group received intensive language instruction aimed at the source of their learning problems. These children could also be enrolled in bilingual education programs but only in the primary grades and only in districts with programs. By and large the special education IEPs for these children looked like the instructional objectives for other PCD children in the respective districts. Misidentification may be associated with inappropriate treatments.

Staffing Process

Legal requirements for the entire staffing process are extensive. The study of PCD pupil files (for all years) shows that on average 8 professionals are present at staffings and 4 written reports are submitted. The typical PCD identification staffing is 45 minutes long excluding time spent in instructional planning (writing the IEP). An undesirable consequence of so many professionals attending staffings is that sometimes parents feel intimidated.

Although there continue to be problems with inadequate records, Colorado districts and BOCS are largely in compliance with the requirements for participation of professionals in staffings. Furthermore, the majority of professionals are satisfied with the thoroughness and efficiency of the staffing process.

Costs

The process of referring, assessing, staffing and placing a PCD child is elaborate and expensive. To allow for more concrete weighing of costs vs. benefits, two separate cost analyses were undertaken and are reported in Chapter 9. Using independent data and separate estimation rules the cost of identifying the average PCD pupil was found to be between $505 and $525. Although this is a one-time cost for a particular child, it reflects an annual expense out of the total Special Education cost for PCD pupils. In 1978-79, the average cost of all special education services to PCD pupils was $1,204. The $505 is the average amount per pupil attributable to all specialist and personnel time spent in assessment and staffing. It is an average cost computed for the total number of PCD pupils regardless of whether their initial placement was that year. When the average cost of identification is not spent on the particular PCD pupil it is being spent on referrals and assessments of children who are eventually not placed or on PCD pupils who will be placed the next year. Thus the $505 is an annual bite out of the $1204 per pupil cost of special education.

The decision to identify a child as handicapped is a serious one and must be supported by adequate data and professional deliberation. Therefore, it is unlikely that enormous savings can be found in the cost of assessment and staffing. Nevertheless, savings can be achieved by eliminating redundant testing with bad tests and by eliminating pro-forma participation of some professions, e.g. the school nurse when it is obvious that all health signs are positive. After cost savings which do not harm the validity of decisions are accomplished, the cost of PCD identification will still be substantial. Therefore, an important issue is whether the cost can be justified for nonhandicapped children, those who have serious educational needs but who do not meet any criteria for PCD or other category of handicap as well as those who might have teaching problems rather than learning problems.

In Chapter 9, the $505 cost of identification is compared to the cost of special education personnel, time spent in direct services to PCD pupils plus support time in planning and traveling. The cost of assessing and staffing one additional PCD pupil is just less than the cost of providing special instruction and support to an additional handicapped child. For nonhandicapped children in need of special services it is relevant to point out that the $505 or $525 cost of identification could purchase 40 hours of tutoring from a certified teacher three hours per week for one-third of the school year. More than twice as much tutoring could be provided if aides were used instead of teachers.

Policy Implications

The full range of reactions to this study and the policy implications seen by special education experts are presented in verbatim reviews in special Appendix E. Key themes drawn from these reviews which we judge to be consistent with our findings are presented here. These statements are brief because ultimately alternatives and solutions must come from special education leaders if new policies are to receive broad support.

The number of PCD children in Colorado is growing. Because of inadequate assessment devices, lack of benchmarks for normal behaviors, and a desire to provide services to children who need them, children are being identified as PCD who do not meet either the legal definition of PCD or definitions in the literature.

Groups of professionals were asked, "To improve the validity of the PCD identification process, would you recommend that the requirements and guidelines be made: stricter, less strict or left unchanged?" The responses were divided nearly in equal thirds with the precise order of preference being: no change, less strict requirements, stricter requirements. One of the most frequent reasons given for wanting less strict requirements is the already onerous paper work. Therefore, the need for better operational criteria identified in this study will have to be pursued without escalating the present level of paper processing. Cost analyses done in this study also suggest that additional requirements should be accompanied by reexamination and elimination of excessive mandatory procedures.

Rules and criteria can be improved. They cannot, however, force valid placements. As with many psychological constructs, the validity of PCD identification cannot be reduced to simplistic statistical rules. Minimal criteria for the reliability and discriminant validity of both formal and informal assessments can be established, but ultimately the integration of separate pieces of diagnostic information must rest on professional judgment. The findings of this study indicate the need for better training of clinicians. The validity of PCD placements is also likely to be enhanced if clinicians feel that more rigorous adherence to the definition of PCD will not deny services to the most extreme cases of children who are not handicapped but who are far behind in school.

Those who seek to reduce the numbers of PCD pupils will have to address the issue of how to provide programs for children identified in this study as having language interference, the more extreme slow learners, children far behind in school because of poverty and poor attendance and emotionally disturbed children whose teachers may not know how to cope with their problems. At the same time clinicians eager to meet the needs of children will have to address the issue of the extra costs and potential harm that results when normal children are called handicapped because regular education is unprepared to serve the full range of normal behaviors and learning styles.

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APPENDIX A

SAMPLING DESIGN AND STATISTICAL ESTIMATION PROCEDURES

The PCD Identification Study employed a stratified multi-stage cluster sampling design. Special Education administrative units (districts or BOCS) were grouped into five strata on the basis of their enrollments. This stratification is shown in the sampling frame in Table A.1. Within strata, a number of clusters (defined to be school districts or groups of school districts (BOCS) were selected at random. The sampling fractions--the ratios of sampled units to the number of units in each stratum (also shown in Table A.1)--were set to allow a much greater representation of units from the strata which had the larger enrollments. Since the numbers of PCD children and numbers of specialists are highly correlated with total school enrollments, average daily attendance estimates were used to govern the sampling strategy at this first stage.

Within selected clusters, a list of PCD children was obtained, and children were selected at random from these lists for inclusion in the study. The same procedure was followed for the selection of PCD teachers and school principals. For the surveys of school psychologists, social workers, and speech-language specialists, lists were obtained in the same way within selected clusters, but all of the members of these groups

Sampling Frame

Special Education Administrative Units Classified as Districts and BOCS and stratified by size according to 1980 ADAE enrollments

Enrollments	Districts		BOCS		Stratum % of Total ADAE	Units Sampling Fraction
N ≥ 28,000	Jefferson County	74,369.9			31.872%	1/1
	Denver	59,321.1				
	Colorado Springs (El Paso II(	29,974.2				
	Total	163,665.2				
	% of Total ADAE	31.872%				
N = 8,000-27,999	Adams/Arapahoe Aurora	21,007.6	Pikes Peak BOCS	23,436.2	46.869%	1/2
	Boulder	20,026.0	Mountain BOCS	13,154.5		
	Pueblo Urban	19,895.3	San Luis Valley BOCS	8,660.0		
	Arapahoe 5 Cherry Creek	18,752.6	Weld BOCS	8,404.2		
	Adams 12 Thornton-Northglenn	17,764.1	Total	53,654.9		
	Arapahoe 6 Littleton	16,210.5	% of Total ADAE	10.449%		
	Mesa	14,507.1				
	Boulder St. Vrain	13,647.4				
	Larimer, Poudre	13,822.6				
	Adams 50 Westminster	12,378.0				
	Weld 6, Greeley	9,549.8				
	Larimer, Thompson	9,459.0				
	Total	187,020.0				
	% of Total ADAE	36.420%				
N < 7.999	El Paso, Widefield	6,525.3	Arkansas Valley BOCS	6468.9	29.259%	7/18 4/11
	Adams 14, Commerce City	5,666.0	San Juan BOCS	6052.2		
	Douglas Castle Rock	6,113.6	South Central BOCS	5665.3		
	Adams 1, Mapleton	4,743.0	Northeastern BOCS	4975.2		
	Pueblo, Rural	4,709.5	Southeastern BOCS	5029.1		
	Adams, Brighton	3,911.4	East Central BOCS	3982.9		
	Delta	3,936.8	Northwest BOCS	4146.7		
	Montrose	4,519.1	Southeast Metro BOCS	2952.4		
	Arapahoe, Englewood	3,507.2	Southwest BOCS	2621.8		
	Fremont, Canon City	3,338.0	South Platte BOCS	2408.4		
	Logan	3,184.7	Rio Blanco BOCS	1283.3		
	Moffat	2.708.0	Total	45586.2		
	Montezuma	2.691.1	% of Total ADAE	8.877%		
	Morgan	2.622.0				
	Arapahoe 2, Sheridan	1,625.8				
	Gunnison	1,451.8				
	Weld, Windsor	1,294.1				
	Larimer, Park	1,033.8				
	Total	63,581.2				
	% of Total ADAE	12.382%				

in the selected units were included in the sample.

Weighting

Estimates of populations and subgroup totals and means were obtained by weighting each case. As described in the Methodology chapter, the weights reflect the number of cases in the population for which each case in the sample stand as proxy. For each hijth unit (unit j in cluster i of stratum h) the weights were defined by

$$\frac{M_h}{m_h} \cdot \frac{N_{hi}}{n_{hi}}$$

The first term shows the ratio of the number of clusters in the stratum to the number of clusters sampled; the second is the ratio of total cases to sampled cases within each cluster. These ratios are the reciprocals of the sampling fractions.

Estimation of Totals, Means and Variances and Calculation of Standard Errors

Following the same notation used for the weights, the population and samples sizes were defined as:

M_h = number of clusters in stratum h

m_h = number of clusters selected,

N_{hi} = number of PCD pupils in the ith selected cluster of stratum h, and

n_{hi} = number of pupils selected from this cluster.

Simple population totals were calculated as:

$$y_h = \frac{M_h}{m_h} \sum_{i=1}^{m_h} \frac{N_{hi}}{n_{hi}} \sum_{j=1}^{n_{hi}} y_{hij}$$

where y_{hij} is any observation or score on the jth pupil sampled in cluster i of stratum h. Population totals, $\hat{y}$, are given by

$$\hat{y} = \sum_{h=1}^{5} y_h \; .$$

To obtain an estimate of the variance of r (mean squared error of r), v(r),

Let $\bar{y}_{hi} = \sum_j y_{hij}/n_{hi}$,

$$\bar{x}_{hi} = \sum_j x_{hij}/n_{ni},$$

$$s^2_{hiy} = \frac{\sum_j (y_{hij} - \bar{y}_{hi})^2}{m_h - 1} ,$$

$$s^2_{hix} = \frac{\sum_j (x_{hij} - \bar{x}_{hi})^2}{m_n - 1} ,$$

$$s_{hixy} = \frac{\sum_j (x_{hi} - \bar{x}_{hi}) (y_{hij} - \bar{y}_{hi})}{m_h - 1}, \text{ and}$$

$$s^2_{2hi} = s^2_{hiy} + r^2 s_{hix} - 2rs_{hixy}.$$

When a ratio of two statistics was the estimate for which variance was to be computed, the formula given below was used which differes from the above only by the following substitution $y_{hij}' = y_{hij} - rx_{hij}$ and by the $\frac{1}{x^2}$ term.

$$v(r) = \frac{1}{x^2} \sum_{h=1}^{5} \frac{M_h^2}{m_h} \left(1 - \frac{m_h}{M_h}\right) \sum_{i=1}^{m_h} \frac{N_{hi}^2 (\bar{y}_{hi} - r\bar{x}_{hi})^2}{M_h - 1}$$

$$+ \frac{M_h}{m_h} \sum_{i=1}^{m_h} \frac{N_{hi}^2}{n_{hi}} \left(1 - \frac{n_{hi}}{N_{hi}}\right) s^2_{2hi}$$

NB. This approximation to the variance is equivalent to the estimate provided by Cochran (1963).

When means or totals were computed for relevant subgroups of the population, the grouping variable was denoted by x_{hij}.

$$x_h = \frac{M_h}{m_h} \sum_{i=1}^{m_h} \frac{N_{hi}}{n_{hi}} \sum_{j=1}^{n_{hi}} x_{hij}$$

Thus x_h is a count of the number of persons in stratum _h_ possessing the subgroup membership of interest.

Then an estimate of the population mean or proportion corresponding to the observations y_{hij} is

$$r = \frac{\sum_{i=1}^{5} y_h}{\sum_{i=1}^{5} x_h} = \frac{y}{x} .$$

For simple population totals the estimates of variance were calculated as follows (for means, $v(\hat{y})$ was divided by the population size):

$\hat{y}$ is the population total estimate

$$\hat{y}_{hi} = \sum_{j=1}^{n_{ni}} y_{nij}$$

$$\hat{y}_n = \sum_{i=1}^{m_h} \hat{y}_{hi}$$

$$s_{2hi} = \sum_{j=1}^{n_{hi}} \frac{(y_{hij} - \bar{y}_{hi})^2}{n_{hi} - 1}$$

$$v(\hat{y}) = \sum_{h-1}^{5} \frac{M_h^2}{m_h} \left(1 - \frac{m_h}{M_h}\right) \sum_{i-1}^{m_h} (y_{hi} - \bar{y}_h)^2 + \frac{M_h}{m_h} \sum_{i=1}^{m_h} \frac{N_{hi}}{n_{hi}} \left(1 - \frac{n_{hi}}{N_{hi}}\right) s_{2hi}^2$$

Interval Estimation.

Computed standard errors, square-roots of the appropriate variance estimates, were used to construct confidence intervals around key reporting values.

For stratified sampling there is no fixed form for the appropriate degrees of freedom to determine t-values for confidence limits. For this study since the total sample from each strata is always greater than 50 in each strata and sometimes much more, a normal approximation should suffice. Confidence intervals were set at ± 2 standard errors to yield approximately 95% confidence.

APPENDIX B

STATISTICALLY SIGNIFICANT DISCREPANCIES BETWEEN ABILITY AND ACHIEVEMENT

A severe discrepancy between intellectual ability and achievement is the primary criterion in the federal rules for identifying children with specific learning disabilities and is central to the Colorado definition of perceptual and communicative disorders. The difference between intellectual and achievement levels of functioning must be extreme before it signifies a handicap. Small differences between intelligence and achievement are normal. Small discrepancies might be caused by normal developmental differences, subtle differences in opportunity to learn, and lack of perfect correlation between abilities and specific learning tasks.

Small or moderate discrepancies can also be the result of measurement error. Therefore, before an observed difference between ability and achievement test scores can be considered severe, it must be, at a minimum, a reliable difference. That is, the discrepancy must not be due to chance, must not be due to random errors in one or both tests. The formulae explained below are used to compute statistically significant discrepancies between IQ and achievement test results. These formulae reflect how big a difference is likely to occur just by chance. Discrepancies, then, which are significant are those which would occur only rarely by chance and are therefore more likely to be real differences.

To actually compute a discrepancy between IQ and achievement, tests scores must be converted to a common metric or scale. If tests have different means and standard deviations, comparisons of raw scores are meaningless. In this study all scores were standardized to the z score scale ($\mu = 0$, $\sigma = 1$) using either the norm group mean and standard deviation or percentile conversions from the normal distribution. In many cases the conversions required several steps. If results on an achievement test were reported as grade-equivalent scores only, norm tables in test manuals were referenced backwards to obtain the raw score corresponding to the reported grade equivalent. Then, given the time of testing and the child's grade placement the raw scores could be used to reference a separate table and obtain the child's percentile rank in the appropriate comparison group. Lastly, the percentile rank was reported as an equivalent z score.

For each PCD pupil, the IQ score from the best test available at the time of the initial staffing was converted to a z score, (e.g. because the WISC-R is more valid than the PVVT, only the WISC-R was used when both were available). All math and reading achievement test scores from the initial assessment (up to six tests per pupil) were also transformed to the z metric. Discrepancies were calculated for each achievement test z score compared to the IQ score.

To test whether each discrepancy was large enough to be reliable, the standard error of the difference (SEM_{dif}) had to be calculated separately for each pair of tests, e.g. the WISC-R IQ test and WRAT Reading achievement test. The standard error of the difference is dependent on both the reliability of the difference (r_{dif}) and the standard deviation of the difference (s_{dif}). Therefore, these values were calculated first. The necessary formulae and a computational example using WISC-R Full Scale IQ and PIAT Reading Recognition and Math are given below. The derivation of these formulae is further explained in Salvia and Ysseldyke (1978) and Thorndike and Hagen (1977).

Prerequisite data obtained from test manuals*

Subscripts are used to denote the WISC-R Full Scale IQ as test 1 and either PIAT Reading Recognition or Math as test 2.

Standard deviation, $s_1 = 1$ (in z units)
$s_2 = 1$ (in z units)

reliability, $r_{11} = .95$ WISC-R manual pp. 32-33 test-retest correlations averaged across ages.

$r_{22} = .89$ Reading Recognition
$= .74$ Math

PIAT manual: test-retest correlations, median across grades.

between test correlation, $r_{12} = .55$ Reading Recognition
.53 Math

PIAT manual: median across grades correlation of PIAT subtest with PPVT. This is conservative estimate since WISC-R is more reliable than PPVT**

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*Wechsler, D. Wechsler Intelligence Scale for Children-Revised: Manual. New York: Psychological Corporation, 1974.

Dunn, L.M. & Markwardt, F.C. Peabody Individual Achievement Test: Manual. Circle Pines, Minn.: American Guidance Services, 1970.

**Note negligible effect of recomputing SEM_{dif} for Read. Rec. with $r_{12} = .65$

$r_{dif} = .77$

$s_{dif} = \sqrt{1 + 1 - 2(.65)} = \sqrt{2 - 1.3} = \sqrt{.7} = .8367$

$SEM_{dif} = .8367 \sqrt{1 - .77} = .8367 \sqrt{.21} = .8367(.4796) = .40$

Reliability of the difference

$$r_{dif} = \frac{\frac{1}{2}(r_{11} + r_{22}) - r_{12}}{1 - r_{12}}$$

$$= \frac{\frac{1}{2}(.95 + .89) - .55}{.45} = \frac{.37}{.45} = .822 \text{ WISC-R \& Reading Recognition}$$

$$= \frac{\frac{1}{2}(.95 + .74) - .53}{.47} = \frac{.315}{.47} = .67 \text{ WISC-R \& Math}$$

Standard deviation of the difference

$$s_{dif} = \sqrt{s_1^2 + s_2^2 - 2r_{12}s_1s_2}$$

$$= \sqrt{1 + 1 - 2(.55)} = \sqrt{2-1.1} = \sqrt{.9} = .95 \text{ WISC-R \& Read. Rec.}$$

$$\sqrt{1 + 1 - 2(.53)} = \sqrt{2-1.06} = \sqrt{.94} = .97 \text{ WISC-R \& Math}$$

Standard error of the difference

$$SEM_{dif} = s_{dif}\sqrt{1 - r_{dif}}$$

$$= .95\sqrt{1-.822} = .95(.4219) = .40 \text{ WISC-R \& Read. Rec.}$$

$$= .97\sqrt{1-.67} = .97(.574) = .56 \text{ WISC-R \& Math}$$

Standard errors of the differences were computed for all of the most frequently used pairs of tests. These standard errors are reported in Table B.1. For infrequently used tests and for tests missing necessary correlational information, standard errors of the difference values were taken from Table B.1 for those tests which most closely matched properties of the test in question. For example, the standard errors of the difference for the Detroit and the WRAT were assumed to be most like those for the Peabody and the WRAT. The Metropolitan Achievement Test has much higher reliability, comparable to the CTBS; therefore WISC-R vs. CTBS standard errors were substituted for WISC-R vs. MAT standard errors.

The sampling distribution for difference scores (discrepancies) is a normal distribution. Therefore the probability statements derived from the normal probability density function can be used to determine

Table B.1

Standard Errors of the Difference for Most Frequently Used Pairs of Tests (in z standard score units)

Most Frequently Used Achievement Tests

Most Frequently Used IQ Tests	WRAT		PIAT		Woodcock Reading	CTBS (typical of group norm-referenced tests)	
	Reading	Math	Read. Rec.	Math		Reading	Math
Peabody Picture Vocabulary Test (PPVT)	.57	.616	.584	.70	.57	.54	.54
	(8.54)	(9.22)					
	(on IQ scale)						
WISC-R	.514	.558	.40	.56	.39	.33	.33
	(7.718)	(8.358)					
	(on IQ scale)						

how large a difference is significantly greater than chance; i.e. very unlikely to have occurred by chance. A critical value of 1.96 standard errors of the difference, establishes a .05 significance level. That is, the obtained discrepancy can be treated as a real discrepancy since a difference this big would occur by chance only 5% of the time. In the text, a significant discrepancy between IQ and achievement at the $\alpha = .05$ level of significance is referred to as a STRICT SIGNIFICANT DISCREPANCY. In Chapter 7 when discrepancies between ability and achievement were used in conjunction with other signs of PCD, a more liberal test of reliable differences was used. The criterion of 1.5 standard errors of the difference was used to identify WEAK SIGNIFICANT DISCREPANCIES; this critical value corresponds to an α-level or error rate of .14. Therefore, within the category WEAK SIGNIFICANT DISCREPANCY, fourteen percent of the time differences as big as those considered significant would be just chance differences.

In concrete terms then, if a child was administered the WRAT math test and the WISC-R IQ, the difference would have to be more than 1.09 standard score points (1.96 x .558 from Table B.1) to be a reliable difference at the conventional .05 level of significance, but only .84 standard score points different (1.5 x .558) to be significant at the weaker .14 level.

APPENDIX C

A COLORADO SURVEY OF ATTITUDES AND PRACTICES FOR IDENTIFYING PERCEPTUAL AND COMMUNICATIVE DISORDERS

PCD Teachers' Questionnaire
Principals' Questionnaire

(The questionnaires for Psychologists, Speech/Language Specialists and Social Workers were similar to the PCD teachers' questionnaires. Copies are available on request)

A COLORADO SURVEY OF ATTITUDES AND PRACTICES FOR IDENTIFYING PERCEPTUAL AND COMMUNICATIVE DISORDERS

Form A: PCD Teachers

Dear ______________________________: Code # ____________________

You are being asked to participate in a statewide study on the identification, assessment, placement, and remediation of perceptual and communicative disordered children in Colorado. The study was mandated by the Colorado Legislature and is funded by the Colorado Department of Education. It is being conducted by faculty and staff of the Laboratory of Educational Research, University of Colorado.

Your district or BOCS is one of the 22 Special Education units selected at random to be included. Your superintendent has been informed of our procedures and permission to contact you directly has been obtained from the Director of Special Education.

Our purpose in sending you this questionnaire is to adequately describe the perceptions of Colorado special education teachers about the PCD identification process. Your name was selected at random from PCD teachers in the participating districts. While participation is voluntary, we urgently need your response to represent those of other teachers who were not chosen themselves.

The following questionnaire should take about 45 minutes to complete. The questions deal with procedures used in assessing and identifying PCD children. If there are any questions that you would prefer not to answer, you may omit them. Although you may not benefit directly from the study, it is hoped special education will benefit, particularly if the study leads to improved definitions of PCD and Department of Education guidelines for identifying such children.

Your name should appear only on the first sheet. Your name will be removed from the questionnaire and destroyed. Data will be analyzed only with your code number and all information will be completely confidential. We need your name only so that we can follow up on nonrespondents.

Dr. Lorrie Shepard, the director of the study, will be glad to answer any questions you might have. She may be contacted at 492-8108. Also the Director of Special Education in your district or BOCS attended a workshop where the purposes and procedures of the study were discussed,

Questions concerning your rights as a subject may be directed to the Human Research Committee at the Graduate School of the University of Colorado; upon request you may obtain a copy of this Institution's General Assurance from the Human Research Committee Secretary, Graduate School, University of Colorado, Boulder, CO 80309.

Please complete the questionnaire as soon as possible. The follow-up of nonrespondents will begin in about two weeks. Mail the completed questionnaire in the envelope provided directly to Dr. Shepard at the Laboratory of Educational Research, University of Colorado, Boulder 80309.

Thank you very much for your time and cooperation.

CDE - DARU FORM CLEARANCE RECOMMENDED
FORM NO 516-A
UNIT SPECIAL EDUCATION SERV. 839-2727
APPROVAL THROUGH DECEMBER, 1980

A COLORADO SURVEY OF ATTITUDES AND PRACTICES FOR IDENTIFYING PERCEPTUAL AND COMMUNICATIVE DISORDERS

Definition of Perceptual and Communicative Disorders

Do you agree or disagree with the following statements? Circle the number that best describes your opinion.

1 = Strongly Agree 2 = Agree 3 = Neutral or Undecided

4 = Disagree 5 = Strongly Disagree

1.* In my opinion, perceptual and communicative disorders are the result of neurological impairments. Strongly Agree 1 2 3 4 5 Strongly Disagree

2.* A PCD child can be distinguished from a slow learner. Strongly Agree 1 2 3 4 5 Strongly Disagree

3.* PCD is an administrative way whereby nonretarded children can receive the help they need. Strongly Agree 1 2 3 4 5 Strongly Disagree

4.* Perceptual & communicative disorders result from an intrinsic disorder, whereas learning problems or learning difficulties result from environmental factors. Strongly Agree 1 2 3 4 5 Strongly Disagree

5.* A formula (e.g. including factors such as mental age, achievement and age) can reasonably be used to determine if a perceptual or communicative disorder is present. Strongly Agree 1 2 3 4 5 Strongly Disagree

6.* Existing assessment techniques are adequate for the diagnosis of PCD disorders. Strongly Agree 1 2 3 4 5 Strongly Disagree

7. Classroom teachers sometimes refer a child for evaluation as PCD simply because the child is lowest in the class and not because he is disabled. Strongly Agree 1 2 3 4 5 Strongly Disagree

8. The most important evidence that a child is PCD is that he is unable to function in the regular classroom. Strongly Agree 1 2 3 4 5 Strongly Disagree

9. A child who is having academic problems but who is dominant in a language other than English should be excluded from PCD because linguistic differences probably explain the learning problems. Strongly Agree 1 2 3 4 5 Strongly Disagree

10. A child who has been absent for more than 30 percent of the school days should not be identified as PCD since the missed instruction probably explains the severe deficit in achievement. Strongly Agree 1 2 3 4 5 Strongly Disagree

11. The decision that a child is PCD is almost never influenced by whether or not there is a space for him or her in a resource room or self-contained class. Strongly Agree 1 2 3 4 5 Strongly Disagree

12. In most cases when a staffing committee decides whether a child is PCD, they do not give enough consideration to whether classroom instruction might be what is causing his or her poor performance. Strongly Agree 1 2 3 4 5 Strongly Disagree

13. PCD is something in the makeup of a child rather than the result of inappropriate instruction. Strongly Agree 1 2 3 4 5 Strongly Disagree

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*asterisked items were adapted from "a Survey of Attitudes Concerning Learning Disabilities" by S. A. Kirk, P. B. Berry, and G. M. Senf in the Journal of Learning Disabilities, 1979, 12, 239-245.

14. In many cases moving a child from one teacher to another or from an "open-space" to a "closed-space" classroom is enough to remedy a mild or moderate perceptual or communicative disorder.	Strongly Agree	1	2	3	4	5	Strongly Disagree
15. What people refer to as a PC disorder is really a condition that most children grow out of naturally.	Strongly Agree	1	2	3	4	5	Strongly Disagree
16. Many children are identified as PCD because they have behavioral or emotional problems rather than a neurological or perceptual problem that causes poor academic performance.	Strongly Agree	1	2	3	4	5	Strongly Disagree
17. Slow learners should be entitled to as much special education help as children who are diagnosed as having a perceptual or communicative handicap.	Strongly Agree	1	2	3	4	5	Strongly Disagree
18. The way the PCD identification and placement procedures now work results in few false designations of PCD, i.e. identifying a child as PCD who in reality has no handicap.	Strongly Agree	1	2	3	4	5	Strongly Disagree
19. The way the PCD identification and placement procedures now work results in few cases of overlooked diagnosis, i.e. failing to identify a child as PCD who in reality has such a handicap.	Strongly Agree	1	2	3	4	5	Strongly Disagree
20. Once the decision is made that a child has PCD, the PCD teacher is capable of designing an effective instructional program.	Strongly Agree	1	2	3	4	5	Strongly Disagree
21. In my opinion, many ethnic minority pupils who are perceptually-communicatively disordered are overlooked in the PCD identification and placement procedures of our district.	Strongly Agree	1	2	3	4	5	Strongly Disagree

22. Sometimes, the judgment of certain individuals is more important than test evidence in the identification and placement of pupils with PCD. In your opinion, do the following individuals have too much, too little, or the right amount of influence on the decision? (Check one blank in each row)

	Too Much	Too Little	Right Amount	Don't Know
1. Pupil's parents	______	______	______	______
2. School principal	______	______	______	______
3. Psychologist	______	______	______	______
4. Outside evaluators	______	______	______	______
5. Classroom teacher	______	______	______	______
6. District spec. educ. administrators	______	______	______	______
7. Special education teacher	______	______	______	______
8. Speech/Lang. specialist	______	______	______	______
9. Other________________	______	______	______	______
10. Other________________	______	______	______	______

23. Indicate in the table below the importance of each factor in determining whether a child has a perceptual or communicative disorder.

1 = Among the most critical factors. Its presence would cause me to believe that the child was PCD (positive indicator).

2 = Important factor. Its presence would cause me to suspect that the child was PCD (positive indicator).

3 = Not an important factor. Its presence leads me neither to believe or not believe that the child is PCD.

4 = Important factor. The presence of this characteristic would lead me to suspect that the child was not PCD (negative indicator).

5 = Among the most critical factors. Its presence would cause me to believe that the child was not PCD (negative indicator).

Factors Affecting Determination of Handicapping Category	Among most critical/ positive indicator	Important/ Positive	Not an important factor either positive or negative	Important/ Negative	Among most critical/ negative indicator
Average IQ	1	2	3	4	5
Verbal/performance discrepancy	1	2	3	4	5
Inadequate speech/language functioning	1	2	3	4	5
Achievement/ability discrepancy	1	2	3	4	5
Below grade-level achievement	1	2	3	4	5
Chronic problem that has not responded to remedial instruction	1	2	3	4	5
Lack of other sources of support in the environment	1	2	3	4	5
Inadequacy of teaching	1	2	3	4	5
Socio-economic disadvantage	1	2	3	4	5
Psychological process deficits	1	2	3	4	5
Physiological-neurological inequalities	1	2	3	4	5
Cultural deprivation	1	2	3	4	5
Linguistic differences	1	2	3	4	5
Minority group membership	1	2	3	4	5
Student is a girl	1	2	3	4	5
Inappropriate Emotional/Behavioral functioning	1	2	3	4	5
Distractibility	1	2	3	4	5
Poor self-help skills	1	2	3	4	5
Good social skills	1	2	3	4	5
Generally good physical health status	1	2	3	4	5
Lack of motor coordination	1	2	3	4	5
IQ between 80 and 85	1	2	3	4	5
Short attention span	1	2	3	4	5
Premature birth	1	2	3	4	5
Achievement good one day but bad the next.	1	2	3	4	5
Aggressiveness	1	2	3	4	5
Achievement adequate in some areas but poor in others.	1	2	3	4	5
Other (Specify)	1	2	3	4	5

Questions 24 and 25

We need to know your perception of the thoroughness and efficiency of the PCD identification process as it is currently implemented in your district. (Check one answer in each set of statements. The first set deals with accurate identification of PCD children; the second set deals with satisfying due process requirements. Due process refers to all those procedures that guarantee the rights of parents to understand each step in the identification process and provide their consent).

24. Set 1: Identification procedures are:

___ Not thorough enough to identify accurately a PCD child and wasteful of staff time.
___ Not thorough enough to identify accurately a PCD child but not wasteful of staff time.
___ About right in thoroughness and efficiency.
___ Thorough enough to identify accurately a PCD child and not wasteful of staff time.
___ Thorough enough but wasteful of staff time.

25. Set 2: Identification procedures are:

___ Not thorough enough to satisfy due process requirements and wasteful of staff time.
___ Not thorough enough to satisfy due process requirements but not wasteful of staff time.
___ About right in thoroughness and efficiency.
___ Thorough enough to satisfy due process requirements and not wasteful of staff time.
___ Thorough enough but wasteful of staff time.

26. Some parents have said that the presence of so many professional people at the staffing conference is intimidating. In your experience, have parents felt this intimidation?

Yes ___ No ___ Not sure ___

27. How far below grade level should a child be to be diagnosed as having a PC disorder? (For example, if you think a first grader must be at least 6 months below grade level to be considered PCD, check 0.5 years.)

Years below grade level.

	0.0 A PCD child does not have to be below grade level.	0.5	1.0	1.5	2.0	2.5
at grade 1						
at grade 3						
at grade 6						
at grade 9						
at grade 12						

28. If a third grade child had a WISC-R IQ score of 90, in your opinion, how low should his or her reading grade equivalent score be (in October) to be a significant discrepancy?

1. 2.7 (35th percentile) or lower
2. 2.5 (28th percentile) or lower
3. 2.2 (21st percentile) or lower
4. 2.0 (12th percentile) or lower

Questions 29 - 32

On the following questions, please state your opinion about the identification of processing disorders (e.g., in memory, language, visual or auditory perception).

29. What percent of PCD children have no processing deficit but have some other evidence of a handicap? __________ %

30. What percent of PCD children have a processing deficit diagnosed by clinical observation rather than test scores? __________ %

31. What percent of PCD children have a processing deficit diagnosed because of wide scatter on a processing test? __________ %

32. What is the minimum difference between a child's scale scores and his average scale score which you would require on the Illinois Test of Psycholinguistic Abilities to identify a significant weakness? __________ points

33. Tests Used in Identifying Perceptual & Communicative Disorders

Consider the tests in all of the following categories. Please evaluate the reliability and validity of each measure you are familiar with, even if it is usually administered by some other specialist.

Frequency of Use

Think of all of the staffings & assessments you have participated in in the last 2 years which lead to a PCD placement (as well as those who were potentially PCD but were staffed and not placed). Indicate below in approximately what % of the cases you used the following tests.

Reliability & Validity

Please indicate below which tests have adequate reliability evidence and are valid for the purpose of identifying perceptual or communicative disorders. Of course, any test could be invalid if used inappropriately. But which tests have research evidence of their validity when used appropriately? Check the columns that apply:

1=Adequate 2=Inadequate
3=Don't know

	Never 0%	Rarely 1-15%	Sometimes 16-50%	Often 51-85%	Nearly Always 86-100%	Reliability			Validity		
						1	2	3	1	2	3
Intelligence Tests											
Detroit Tests of Learning Aptitude											
Peabody Picture Vocabulary Test (PPVT)											
Slosson Intelligence Test for Children and Adults											
Stanford Binet Intelligence Scale											
WISC-R											
Woodcock-Johnson Psychoeducational Battery											
Achievement Tests											
Brigance Diagnostic Inventory of Basic Skills											
California Test of Basic Skills (CTBS)											
Diagnostic Reading Scales											
Durrel Analyses of Reading Difficulty											
Gates-MacGinitie Reading Tests											
Gates-McKillop Reading Diagnostic Tests											
Gillmore Oral Reading Test											
Gray Oral Reading Test											
Iowa Test of Basic Skills (ITBS)											
KeyMath Diagnostic Arithmetic Test											
Metropolitan Achievement Test											
Peabody Individual Achievement Tests (PIAT)											
Spache Diagnostic Reading Scales											
Sucher Allred Reading Placement Inventory											
Test of Reading Comprehension											
Test of Written Language											
Wide Range Achievement Test (WRAT)											
Woodcock Reading Mastery Tests											
Behavioral Recordings											
Frequency counting or event recordings											
Permanent products											
Adaptive Behavior Scales											
AAMD Adaptive Behavior Scale (School Version)											
Vineland Social Maturity Scale											

Frequency of Use

Reliability & Validity

1=Adequate 2=Inadequate 3=Don't Know

	Never 0%	Rarely 1-15%	Some-times 16-50%	Often 51-85%	Nearly Always 86-100%	Reliability			Validity		
						1	2	3	1	2	3
Personality Tests											
Draw-A-Person (Goodenough-Harris Drawing Test)											
Kinetic Family Drawing											
Piers-Harris Self-Concept Scale											
Sentence Completion											
Perceptual and Processing Tests											
Beery Developmental Test of Visual-Motor Integration (VMI)											
Bender (Visual-Motor) Gestalt Test											
Frostig Developmental Test of Visual Perception											
Goldman-Fristoe-Woodcock Test of Auditory Discrimination (GFW)											
Lindamood Auditory Conceptualization Test											
Memory for Designs Test											
Motor-Free Visual Perception Test											
Purdue Perceptual-Motor Survey											
Spencer Memory for Sentences Test											
Wepman Auditory Discrimination Test (The Wepman)											
Speech and Language Tests											
Boehm Test of Basic Concepts											
Carrow Tests for Auditory Comprehension of Language											
Fisher-Logemann Test of Articulation Competence											
Goldman-Fristoe Test of Articulation											
Illinois Test of Psycholinguistic Abilities (ITPA)											
Northwestern Syntax Screening Test											
Slingerland Screening Test for Identifying Children with Specific Language Disability											
Templin-Darley Tests of Articulation											
Test of Language Development											
Token Test											
Utah Test of Language Development											
Wiig											

Do you agree or disagree with the following statements? Circle the number that best describes your opinion.

34. Observation of a discrepancy in the classroom between potential and performance should be sufficient evidence of a PC disorder even if there is not a significant discrepancy on standardized tests. Strongly Agree 1 2 3 4 5 Strongly Disagree

35. It is possible to make valid diagnoses of PC disorders from invalid tests if they are only used as stimuli to test clinical hypotheses. Strongly Agree 1 2 3 4 5 Strongly Disagree

36. Tests results should be clearly secondary to clinical judgments in arriving at a PCD diagnosis. Strongly Agree 1 2 3 4 5 Strongly Disagree

37. If you agree or strongly agree, describe what steps should be taken by professionals to ensure the validity of clinical judgments.

38. A "non-categorical" category should be created to meet the needs of children with mild handicaps who cannot be identified by the standard definition of PCD. Strongly Agree 1 2 3 4 5 Strongly Disagree

39. Even if a scientifically verifiable handicap cannot be identified, there are many children for whom special education, is essential because their needs cannot be met in the regular classroom. Strongly Agree 1 2 3 4 5 Strongly Disagree

Recommendations for changes in the state requirements or guidelines for the identification of PCD:

40. First, in order to improve the validity of the PCD identification process would you recommend that the requirements and guidelines be made:

______ Stricter? ______ Less strict? ______ Be left unchanged?

41. Please give your specific suggestions for policy changes:

Allocation of Specialists' Time

42. Approximately how many assessments and staffings for the identification of handicapped children did you participate in during the 79-80 school year? __________

43. How many of these pupils were identified as PCD? __________

44. How many of these pupils had some PCD-like characteristics but were eventually not placed in PCD? __________

45. How many of these pupils had some other handicap or were considered for a handicapped placement other than PCD? __________

46. In your school, what is the approximate length in minutes of the average staffing meeting where placement decisions are made (excluding time spent on the IEP)?

Average length: __________ minutes

47. What was the length of the shortest meeting?_____mins.; the longest meeting?_____mins.

48. Consider all of the time you spent last year attending all staffings. Estimate what percent of time was spent in the following types of staffings:

______ % was spent in staffings to determine handicapping condition and placement.
______ % was spent in IEP or other staffing for instructional planning.
______ % was spent in annual reviews.
______ % other, specify____________________________________.
100 % of total time spent in staffing.

49. Consider all of the time you spent last year in screening, testing and assessment. Estimate what percent of time was spent in the following types of assessment activities:

______ % was spent in assessment to determine if a handicap existed and in preparing for placement staffings.
______ % was spent in assessment for purposes of instructional planning.
______ % was spent in assessment to measure pupil progress in special education placements.
______ % other, specify____________________________________.
100 % of total time spent in screening, testing and assessment.

Instructional Programs for PCD Pupils

Indicate whether you agree or disagree with the following statements:

50. Teaching such learning processes as attention, memory, and discrimination is a necessary part of teaching skills such as reading, writing, etc. Strongly Agree 1 2 3 4 5 Strongly Disagree

51. One need not concern oneself with learning processes such as memory, attention, and discrimination if one uses a task analysis approach. Strongly Agree 1 2 3 4 5 Strongly Disagree

52. Many PCD teachers conduct further assessments--following the staffing or IEP decision--to plan the instructional program for pupils newly identified as PCD. Do you use assessment devices for post-staffing planning? Yes_______ No_______

53. If you answered yes to the above question, please list the 10 assessment devices which you most often use to plan the instructional program for pupils newly identified as PCD.

1________________________________
2________________________________
3________________________________
4________________________________
5________________________________
6________________________________
7________________________________
8________________________________
9________________________________
10________________________________

Questions 54 - 59

For the time when you are providing direct services to PCD children, estimate what percent of time you spend doing each of the following activities:

54. Repetition & drill on basic skills which are prerequisites for regular classroom (grade-level) work. __________ %

55. One-to-one instruction or tutoring with regular classroom work. __________ %

56. Direct training of psychological processes such as visual discrimination, auditory memory and attention. __________ %

57. Process training using materials adapted from regular classroom work. __________ %

58. Teaching appropriate behaviors; informal counseling aimed at improving self-concept; or behavior modification. __________ %

59. Other. Please describe. ______________________________
____
______________________________ __________

100 % (Total time you spend in direct services to PCD students).

60. Is your assignment in a self-contained classroom __________
a resource room __________?

61. What is your average case load, i.e., the number of students to whom you provide instructional services during a typical week? (Do not count consultation with regular classroom teacher or screening, assessment & staffing.) __________ pupils

62. Many handicapped children may have a part-time placement in your classroom. At any one time during the school day or school year, what is the maximum number of students you ever have in your classroom at the same time? __________ pupils

63. Estimate the average number of children that you have in your classroom at one time. __________ pupils

64. Indicate how important the following factors are likely to be in your decision to recommend that a child be STAFFED OUT of PCD placement.

1 = Among the most critical factors
2 = Important, but not one of the most critical factors
3 = Positive sign, but not sufficient by itself
4 = Considered, but among the least important factors
5 = Not considered

Factors Affecting Decision to Staff out of PCD	Among Most Critical	Important	Positive Sign	Among Least Important	Not Considered
Test results show that the child no longer has a significant discrepancy between ability & achievement.	1	2	3	4	5
Test results show that the child no longer has any discrepancy between ability and achievement.	1	2	3	4	5
Test results show that academic performance has been brought up to grade level.	1	2	3	4	5
In your judgment academic performance has been brought up to grade level.	1	2	3	4	5
Instructional goals set on the IEP have been attained.	1	2	3	4	5

Factors Affecting Decision to Staff out of PCD	Among Most Critical	Important	Positive Sign	Among Least Important	Not Considered
Test results show elimination of processing disorders which were present initially.	1	2	3	4	5
In your judgment, processing deficits have been sufficiently reduced so they no longer interfere with classroom performance.	1	2	3	4	5
Reduction of behavior problems such as inattention or hyperactivity.	1	2	3	4	5
Your judgment about ability to function in the regular classroom without further help.	1	2	3	4	5

Background Information of Respondent

65. Type of School:
Elementary _____
Middle _____
Junior High _____
High _____

66. In selecting you for this survey, we have identified you as a PCD teacher.
Is this classification correct for the 1980-81 school year? Yes ____ No ____
If this classification is incorrect, please indicate your specialty.

1. Speech and Language Specialist
2. School Psychologist
3. Social Worker
4. Teacher
5. Other ______________________

67. How many years have you held this kind of position? State the nearest whole number of years and count this year (80-81) as one year.

Number of years: ______ in this district
______ in Colorado, other than in this district
______ outside of Colorado
______ Total number of years of experience in this kind of position

68. In addition to the years reported above, how many years of experience have you had in other educational positions?
______ years.

69. Please indicate below the academic degrees you have earned; and for each degree indicate the year the degree was earned and the institution (college or university) that awarded the degree.

Degree	Year	Institution
Bachelors	____	______________________________
Masters	____	______________________________
Specialist	____	______________________________
Doctorate	____	______________________________

70. What educational certificates do you hold?

	Colorado	Other State
Classroom teacher	________	________
Special education teacher	________	________
Other (Specify)	________	________

71. Please indicate which of the following have been most influential in helping you understand the characteristics of PCD pupils and in shaping your current assessment practices for the identification of PCD children.

Check those which apply and indicate year of participation:

	I participated in (✓)	I was strongly influenced by (✓)	Most recent year of Participation
College or University degree program			
More recent non-degree course work at a College or University			
District inservice			
Other workshops: Specify ________			
CDE site visit			
Reading in professional journals			
Regional or national professional meeting			
A colleague's informal advice or consultation			
Other (Specify) ________			

A COLORADO SURVEY OF ATTITUDES AND PRACTICES FOR IDENTIFYING PERCEPTUAL AND COMMUNICATIVE DISORDERS

Form E: Principals

Dear ______________________________: Code # ______________

You are being asked to participate in a statewide study on the identification, assessment, placement, and remediation of perceptual and communicative disordered children in Colorado. The study was mandated by the Colorado Legislature and is funded by the Colorado Department of Education. It is being conducted by faculty and staff of the Laboratory of Educational Research, University of Colorado.

Your district or BOCS is one of the 22 Special Education units selected at random to be included. Your superintendent has been informed of our procedures and permission to contact you directly has been obtained from the Director of Special Education.

Our purpose in sending you this questionnaire is to adequately describe the perceptions of Colorado principals about the PCD identification process. Your name was selected at random from principals in the participating districts. While participation is voluntary, we urgently need your response to represent those of other principals who were not chosen themselves.

The following questionnaire should take about 35 minutes to complete. The questions deal with procedures used in assessing and identifying PCD children. If there are any questions that you would prefer not to answer, you may omit them. Although you may not benefit directly from the study, it is hoped that special education will benefit, particularly if the study leads to improved definitions of PCD and Department of Education guidelines for identifying such children.

Your name should appear only on the first sheet. Your name will be removed from the questionnaire and destroyed. Data will be analyzed only with your code number and all information will be completely confidential. We need your name only so that we can follow up on nonrespondents.

Dr. Lorrie Shepard, the director of the study, will be glad to answer any questions you might have. She may be contacted at 492-8108. Also, the Director of Special Education in your district or BOCS attended a workshop where the purposes and procedures of the study were discussed.

Questions concerning your rights as a subject may be directed to the Human Research Committee at the Graduate School of the University of Colorado; upon request you may obtain a copy of this Institution's General Assurance from the Human Research Committee Secretary, Graduate School, University of Colorado, Boulder, CO 80309.

Please complete the questionnaire as soon as possible. The follow-up of nonrespondents will begin in about two weeks. Mail the completed questionnaire in the envelope provided directly to Dr. Shepard at the Laboratory of Educational Research, University of Colorado, Boulder 80309.

Thank you very much for your time and cooperation.

CDE - DARU FORM CLEARANCE
FORM NO. CDE-516-E RECOMMENDED
UNIT SPECIAL EDUCATION 839-2727
APPROVAL THROUGH DECEMBER 1980

A COLORADO SURVEY OF ATTITUDES AND PRACTICES FOR IDENTIFYING PERCEPTUAL AND COMMUNICATIVE DISORDERS

Definition of Perceptual and Communicative Disorders

Do you agree or disagree with the following statements? Circle the number that best describes your opinion.

1 = Strongly Agree 2 = Agree 3 = Neutral or Undecided

4 = Disagree 5 = Strongly Disagree

1.*	A PCD child can be distinguished from a slow learner.	Strongly Agree	1	2	3	4	5	Strongly Disagree
2.*	PCD is an administrative way whereby non-retarded children can receive the help they need.	Strongly Agree	1	2	3	4	5	Strongly Disagree
3.	Classroom teachers sometimes refer a child for evaluation as PCD simply because the child is the lowest in the class and not because he is disabled.	Strongly Agree	1	2	3	4	5	Strongly Disagree
4.	The most important evidence that a child is PCD is that he is unable to function in the regular classroom.	Strongly Agree	1	2	3	4	5	Strongly Disagree
5.	A child who is having academic problems but who is dominant in a language other than English should be excluded from PCD because linguistic differences probably explain the learning problems.	Strongly Agree	1	2	3	4	5	Strongly Disagree
6.	A child who has been absent for more than 30 percent of the school days should not be identified as PCD since the missed instruction probably explains the severe deficit in achievement.	Strongly Agree	1	2	3	4	5	Strongly Disagree
7.	The decision that a child is PCD is almost never influenced by whether or not there is a space for him or her in a resource room or self-contained class.	Strongly Agree	1	2	3	4	5	Strongly Disagree
8.	In most cases when a staffing committee decides whether a child is PCD, they do not give enough consideration to whether classroom instruction might be what is causing his or her poor performance.	Strongly Agree	1	2	3	4	5	Strongly Disagree
9.	PCD is something in the makeup of a child rather than the result of inappropriate instruction.	Strongly Agree	1	2	3	4	5	Strongly Disagree
10.	In many cases moving a child from one teacher to another or from an "open-space" to a "closed-space" classroom is enough to remedy a mild or moderate perceptual or communicative disorder.	Strongly Agree	1	2	3	4	5	Strongly Disagree
11.	What people refer to as PC disorders is really a condition that most children grow out of naturally.	Strongly Agree	1	2	3	4	5	Strongly Disagree
12.	Many children are identified as PCD because they have behavioral or emotional problems rather than a neurological or perceptual problem that causes poor academic performance.	Strongly Agree	1	2	3	4	5	Strongly Disagree
13.	Slow learners should be entitled to as much special education help as children who are diagnosed as having a perceptual or communicative handicap.	Strongly Agree	1	2	3	4	5	Strongly Disagree

*asterisked items were adapted from "a Survey of Attitudes Concerning Learning Disabilities" by S. A. Kirk, P. B. Berry, and G. M. Senf in the *Journal of Learning Disabilities*, 1979, 12, 239-245.

14. In some schools principals are using resource rooms to relieve some of the pressure of class size in regular classrooms. — Strongly Agree 1 2 3 4 5 Strongly Disagree

15. Between initial referral and final placement of a potentially PCD child, every possible alternative is considered and tried, therefore almost all pupils who are eventually staffed are confirmed to be PCD. — Strongly Agree 1 2 3 4 5 Strongly Disagree

16. In my school, the mini-staffing (or assessment) team is very effective in eliminating cases who are not truly PCD. Therefore, a very large percentage of those who reach a final staffing are confirmed as PCD. — Strongly Agree 1 2 3 4 5 Strongly Disagree

17. If the general education budget could pay for remedial education, there would not be the need to place so many children as PCD. — Strongly Agree 1 2 3 4 5 Strongly Disagree

18. Regular classroom teachers, if effectively trained, could teach all but the most severe PCD children. — Strongly Agree 1 2 3 4 5 Strongly Disagree

19. The present identification and staffing procedures leave too little discretion for the school principal to deal with the educational needs of children with PCD. — Strongly Agree 1 2 3 4 5 Strongly Disagree

20. In my school there is good cooperation between the classroom teachers and the PCD teachers over the education of a PCD child. — Strongly Agree 1 2 3 4 5 Strongly Disagree

21. It is up to the professionals (PCD teachers, psychologists, speech-language specialists) to decide what tests to give and how much time to spend in evaluating a potentially PCD child. — Strongly Agree 1 2 3 4 5 Strongly Disagree

22. The way the PCD identification and placement procedures now work results in few false designations of PCD, i.e. identifying a child as PCD who in reality has no handicap. — Strongly Agree 1 2 3 4 5 Strongly Disagree

23. The way the PCD identification and placement procedures now work results in few cases of overlooked diagnosis, i.e. failing to identify a child as PCD who in reality has such a handicap. — Strongly Agree 1 2 3 4 5 Strongly Disagree

24. Once the decision is made that a child has PCD, the PCD teacher is capable of designing an effective instructional program. — Strongly Agree 1 2 3 4 5 Strongly Disagree

25. In my opinion, many ethnic minority pupils who are perceptually-communicatively disordered are overlooked in the PCD identification and placement procedures of our district. — Strongly Agree 1 2 3 4 5 Strongly Disagree

26. How far below grade level should a child be to be diagnosed as having a PC disorder? (For example, if you think a first grader must be at least 6 months below grade level to be considered PCD, check 0.5 years.)

	Years below grade level					
	0.0 A PCD child does not have to be below grade level.	0.5	1.0	1.5	2.0	2.5
at grade 1						
at grade 3						
at grade 6						
at grade 9						
at grade 12						

27. Sometimes, the judgment of certain individuals is more important than test evidence in the identification and placement of pupils with PCD. In your opinion, do the following individuals have too much, too little, or the right amount of influence on the decision?

Check one blank in each row

	Too Much	Too Little	Right Amount	Don't Know
1. Pupil's parents				
2. School principal				
3. Psychologist				
4. Outside evaluators				
5. Classroom teacher				
6. District spec. educ. administrators				
7. Special education teacher				
8. Speech/Lang. Specialist				
9. Other________________				
10. Other________________				

28. Some parents have said that the presence of so many professional people at the staffing conference is intimidating. In your experience, have parents felt this intimidation?

Yes ___ No ___ Not sure ___

29. In what percent of cases (which reach formal staffing) are parent desires and pressures strongly influential in the decision regarding PCD placement? _______ %

Please break down this percent into those who advocate and those who resist PCD placement. For example, if 10% of the cases are strongly influenced by parent desires, and of these half advocate PCD placement and half resist it, report 5% and 5%.

_______ % advocate PCD placement

_______ % resist PCD placement

30. Overall, how would you rate the validity of the PCD identification process as it is implemented in your school? (Circle the number which best reflects the degree of validity.)

1	2	3	4	5	6
Extremely valid		Moderately valid		Completely invalid	I don't feel qualified to judge the validity of the identification procedures

31. Nationally, there has been a trend in recent years for Special Education to require a larger proportion of the total education budget because more handicapped children are being identified and served.

Would you say that this trend has also occurred in your school district?

Yes _______ No _______

32. In your school, is there a need for greater resources for Special Education (e.g., more specialist teachers, psychologists or social workers) than you currently have available?

Yes _______ No _______

33. Would you prefer to see more or less allocation to Special Education from the following sources?

	More	Less	Should stay the same
Federal			
State			
Local District			

Questions 34 and 35

We need to know your perception of the thoroughness and efficiency of the PCD identification process as it is currently implemented in your district. (Check one answer in each set of statements. The first set deals with accurate identification of PCD children; the second set deals with satisfying due process requirements. Due process refers to all those procedures that guarantee the rights of parents to understand each step in the identification process and provide their consent).

34. Set 1: Identification procedures are:

___ Not thorough enough to identify accurately a PCD child and wasteful of staff time.
___ Not thorough enough to identify accurately a PCD child but not wasteful of staff time.
___ About right in thoroughness and efficiency.
___ Thorough enough to identify accurately a PCD child and not wasteful of staff time.
___ Thorough enough but wasteful of staff time.

35. Set 2: Identification procedures are:

___ Not thorough enough to satisfy due process requirements and wasteful of staff time.
___ Not thorough enough to satisfy due process requirements but not wasteful of staff time.
___ About right in thoroughness and efficiency.
___ Thorough enough to satisfy due process requirements and not wasteful of staff time.
___ Thorough enough but wasteful of staff time.

Recommendations for changes in the state requirements or guidelines for the identification of PCD:

36. First, in order to improve the validity of the PCD identification process would you recommend that the requirements and guidelines be made:

______ Stricter? ______ Less strict? ______ Be left unchanged?

37. Please give your specific suggestions for policy changes:

38. In your school, what is the approximate length in minutes of the average staffing meeting where PCD placement decisions are made (excluding time spent on the IEP)?

Average length: ____ mins.

39. What is the length of the shortest meeting? ____ mins.; the longest meeting? ____ mins.

40. What proportion of your time (using 40 hours as an arbitrary base rate) do you spend in or preparing for staffing meetings for PCD children?

____ average # of hours out of 40/per week

41. What is the average number of pupils in regular classes in your school? ____

42. What is the average number of pupils served at any one time,

in self-contained Special Education classes in your school ____
in resource rooms in your school? ____

43. Indicate how important the following factors are likely to be in your decision to recommend that a child be STAFFED OUT of PCD placement.

1 = Among the most critical factors
2 = Important, but not one of the most critical factors
3 = Positive sign, but not sufficient by itself
4 = Considered, but among the least important factors
5 = Not considered

Factors Affecting Decision to Staff out of PCD	Among Most Critical	Important	Positive Sign	Among Least Important	Not Considered
Test results show that the child no longer has a significant discrepancy between ability & achievement.	1	2	3	4	5
Test results show that the child no longer has any discrepancy between ability and achievement.	1	2	3	4	5
Test results show that academic performance has been brought up to grade level.	1	2	3	4	5
In the teacher's judgment academic performance has been brought up to grade level.	1	2	3	4	5
Instructional goals set on the IEP have been attained.	1	2	3	4	5
Test results show elimination of processing disorders which were present initially.	1	2	3	4	5
In the teacher's judgment, processing deficits have been sufficiently reduced so they no longer interfere with classroom performance.	1	2	3	4	5
Reduction of behavior problems such as inattention or hyperactivity.	1	2	3	4	5
The teacher's judgment about ability to function in the regular classroom without further help.	1	2	3	4	5

Background Information of Respondent

44. Type of School:
Elementary ____
Middle School ____
Junior High School ____
High School ____

45. In selecting you for this survey, we have identified you as a school principal. Is this classification correct for the 1980-81 school year? Yes ____ No ____
If this classification is incorrect, please indicate your current role.

____

46. How many years have you held this kind of position? State the nearest whole number of years and count this year (80-81) as one year.

Number of years: ____ in this district
____ in Colorado, other than in this district
____ outside of Colorado
____ Total number of years of experience in this kind of position

47. In addition to the years reported above, how many years of experience have you had in other educational positions?

____ years.

48. Please indicate below the academic degrees you have earned; and for each degree indicate the year the degree was earned and the institution (college or university) that awarded the degree.

Degree	Year	Institution
Bachelors	____	____________________
Masters	____	____________________
Specialist	____	____________________
Doctorate	____	____________________

Appendix D

EXPLANATION OF THE QUALITY RATINGS OF THE PROCESSING DEFICIT INFORMATION

A staffing committee is comprised of professionals from various disciplines. This was mandated by PL 94-142. (20 U.S.C. 1415 (b)(2)(B) (121a.532e)).

"The evaluation is made by a multi-disciplinary team or group of persons, including at least one teacher or other specialist with knowledge in the area of suspected disability."

A team approach is required to encourage a process which Webb (1966) calls "triangulation".

"Once a proposition has been confirmed by two or more independent measurement processes, the uncertainty of its interpretation is greatly reduced. The most persuasive evidence comes through a triangulation of measurement processes. If a proposition can survive the onslaught of a series of imperfect measures, with all their irrelevant error, confidence should be placed in it. Of course, this confidence is increased by minimizing error in each instrument and by a reasonable belief in the different and divergent effects of the sources of error."(pg. 3).

When children are assessed for placement in Special Education, triangulation takes two forms. The first is a specialist's use of various diagnostic procedures to confirm a suspected problem. As Salvia and Ysseldyke (1978) explain: "Having identified one or more areas of potential weakness, the diagnostician then selects more precise assessment techniques to confirm the existence of a problem. Certain tests, direct observations, and current indirect expert judgments are particularly useful at this stage." (pp. 11-12). The use of different techniques is necessary because 1) the instruments available for diagnosing learning disabilities usually lack the psychometric properties to stand alone, and 2) the problems being investigated are often not directly observable and must be inferred from the child's performance in several contexts. As Wallace and Larsen (1978) contend: "...the use of any assessment procedure to the exclusion of all others has many inherent dangers. The individual differences among all children clearly implies that different assessment procedures will be successful with different students. Each diagnostic technique has distinct advantages and disadvantages when used with different types of children in certain situations, and, consequently, the best method usually employs a variety of assessment techniques." (p. 64).

The other aspect of triangulation involves independent confirmation of the same difficulty by various professionals who see the child from different perspectives. According to Salvia and Ysseldyke (1978) "The judgments and assessments made by others can play an important role in assessment...Diagnosticians seek out other professionals to complement their own skills and background. Thus, referring a student to various specialists (audiologists, ophthalmologists, reading teachers, and so on) is a common and desirable practice in assessment." (p. 9). In order to insure that the judgments are independent and not influenced by the group process of a staffing, there should be reports written prior to the staffing in which assessment results are summarized.

Based on the above theoretical considerations, two dimensions were identified as important in evaluating the quality of the perceptual or processing deficit information. These were the use of 1) independent professional judgments and 2) intra-professional hypothesis testing using various methods to verify deficits cited or considered in the placement decisions.

Because the written reports available in case files do not always document the individual clinician's line of reasoning in piecing together confirming or contradictory evidence from different measure, no attempt was made to rate the quality of intra-professional hypothesis testing. However, the following coding scheme was developed to determine the quality of the confirmation of a process and/or perceptual deficit by independent professional judgment.

Processing Deficit Cited

The first code indicated whether or not a perceptual and/or processing deficit was cited in the decision that a handicapping condition existed: 1 = Yes, 0 = No. It seemed reasonable to make separate assessments of quality depending upon whether the interpretation of a processing deficit was essential to the determination of a handicap.

Number of Professionals

The second code indicated the number of professionals who reported information concerning perceptual or process strengths and weaknesses. This variable would be blank if no professionals submitted reports or if no reports were available in the child's file. If this variable was blank or "1", the rating of the next variable would also be blank.

Agreement Among Professionals

The third code indicated the extent of the agreement among the professionals on the following scale:

4 - COMPLETE AGREEMENT
All professionals recorded a weakness in the identical area(s) and no others.

3 - SOME CONFIRMATION
All professionals recorded a weakness in one or more areas and some professionals, but not all, noted weaknesses in other areas. For example, the three participating specialists all noted an auditory discrimination problem, one also noted a problem with grammatic closure and one found a weakness in visual-motor integration.
No one area was cited as a problem by all professionals; but a weakness in at least one area was cited by two or more professionals. Other weaknesses may or may not have been noted. For example, two professionals concluded that the child had a visual perception problem, a third did not.

2 - NO CONFIRMATION

No one area was cited as a weakness by more than one professional, but no contradictions were noted. For example, the psychologist cited a problem in short-term memory and the speech-specialist detected a problem in auditory discrimination.

1 - CONTRADICTORY

An area was cited as a weakness by one professional and as a strength by another.

Congruence Between Professionals and Basis of Handicap

The final rating scale indicated the extent of agreement between the deficits cited in the placement decision (basis for determination of handicap) and those cited in the individual reports submitted by various professionals.

6 - CONFIRMED AND NO CONTRAINDICATORS

The deficit area is cited in the placement decision report only if more than one professional identified it as a weakness and none cited it as a strength.

5 - CONFIRMED

The only area(s) cited were identified by more than one professional

4 - SOME CONFIRMED

Only those areas which are confirmed are cited, but some which are confirmed are not cited - no apparent reason.

3 - ALL POSSIBLE

All deficits cited by any professional are included in the placement decision or some deficits were cited but not included with no apparent reason.

2 - INCONSISTENT INCLUSION

Some deficits confirmed by more than one professional were not included in the description of handicap, while others were included although unconfirmed; or some were included when cited by one professional and some were included which no professional had cited- OR any deficit cited by any professional was included even though another professional called the deficit area a strength.

1 - NO EVIDENCE

The areas listed as the basis for handicapping condition were not cited by any professional.

0 - CONTRADICTORY

Areas were cited in basis as a weakness when the only evidence available from professionals cited it as a strength.

APPENDIX E

REVIEWS OF THE DRAFT REPORT

Reactions to the preliminary report of findings were solicited from both national and state experts in special education. The nationally recognized experts in learning disabilities from outside of Colorado were:

Dr. Barbara Keogh
(to be submitted)

Dr. Samuel Kirk
(to be submitted)

Dr. James E. Ysseldyke, Director
Institute for Research on Learning Disabilities
University of Minnesota

Colorado experts selected to represent various disciplines and institutions were:

Betsy Anderson, M.A.
Denver Public Schools
Consultant on Woodcock-Johnson Psycho-Educational Battery/
IPCD teacher

Dr. James A. De Ruiter
Associate Professor
Chairman, Department of Special Learning Problems
School of Special Education
University of Northern Colorado

Dr. Joan M. Fairchild
Coordinator, Special Education Program
School of Education
University of Colorado, Colorado Springs

Dr. Stephen E. Hodge
Coordinator, School Psychology Program
School of Education
University of Colorado at Boulder

Dr. Margaret L. Lemme
Associate Professor
Department of Speech Pathology and Audiology
University of Denver

Dr. Eleanor Lowrey
South Area Manager
Special Education
Jefferson County Schools R-1

Anne Mitchell, ACSW, LSWII
National Association of Social Workers

Dr. Kenneth R. Seeley
Coordinator of Special Education
School of Education
University of Denver

Directors in the 22 participating districts and BOCS were asked to comment on the report. In keeping with our policy of anonymity for the sampled units, these are published without identification. Only eight of the 22 special education units submitted written comments; they are presented in order by date of reply.

Chapter 10, findings and related issues, was not included in the preliminary copy of the report; and therefore was not subject to review; technical appendix B was also omitted. Reviewers were asked especially to comment on the methodological adequacy of the study, the congruence of the findings with their own knowledge of identification practices and the policy implications of the study results.

The reviews are published in their entirety in the following pages. If a change was made in the body of the report in response to a reviewer criticism, the corresponding page number is noted in the right margin. Asterisked numbers are used to link comments to explanations or responses which we provide on the page following each reviewers' comments. We generally tried to answer technical points or to clarify instances where our analysis may have been misunderstood. We do not discuss or evaluate the policy statements since these reflect the special insights, expertise, and point of view of the reviewers.

Commentary on the University of Colorado Laboratory of Educational Research "Evaluation of the Identification of Perceptual-Communicative Disorders in Colorado"

James E. Ysseldyke
Institute for Research on Learning Disabilities
University of Minnesota

In commenting on this extensive investigation, I do so in the context of our extensive study over the past four years of the assessment and decision-making process with a national sample of school systems. The findings of the Colorado investigation are for the most part congruent with our findings on assessment and decision making: policy issues are nearly the same, similar abuses have been identified, and both lines of research point to very significant problems - in Colorado and throughout the nation - in efforts to identify and serve learning disabled students.

The Colorado study was exceptionally well-designed and executed. Initially, I was disappointed to learn that the investigators had relied only on survey (self-report) and case history review as methods of data collection. Self-report methodology has been shown to be a relatively risky means of collecting data on professionals' decision-making activities. Yoshida and his colleagues at the Bureau of Education for the Handicapped (BEH) used a questionnaire/self-report methodology to study team decision making in Connecticut. Subsequent research indicates that these BEH investigators may have received an overly optimistic view of the process and its outcomes. After reading the Colorado study it is my opinion that the methods used did yield results that paint an accurate picture of the identification process and its outcomes. This, of course, was facilitated by the exceptionally high rate of response to the survey. Responses obtained to the questions asked provide new information about the identification of PCD students.

I believe there is still a need to verify the findings of this report by actually observing and systematically recording the events that characterize a large sample of team meetings. In this way the investigators could produce data on what actually happens rather than on what people say they do. I recognize that this kind of investigation would require additional financial support.

Because I see no specific methodological problems, my commentary focuses on the findings of the study. In commenting, I proceed chapter by chapter through the report, and this necessarily encourages some redundancy.

A couple of observations are in order on the initial introduction/literature review. The authors state that there is little evidence regarding characteristics of students in LD classes. They cite only two studies *1 (Norman & Zigmond, 1980; Kirk & Elkins, 1975). Ever since the term "learning disability" was used, professionals have been trying to describe the characteristics of "learning disabled" students. The descriptions have not been contributive, because of the large number of differences in the populations of students identified as LD. The Norman and Zigmond (1980) and Kirk and Elkins descriptions are among the best available. Most descriptions of LD students have consisted of efforts to describe, but not differentiate, the students from others (emotionally disturbed, underachievers, etc.). Ysseldyke, Algozzine, Shinn, and McGue (in press) contrasted learning disabled and underachieving students on 49 psychometric measures. They found a 96% overlap in the performance of the two groups, with no significant difference between the groups on any psychometric measure.

In Chapter 3 the investigators report that most school districts say they use the state definition and "state guidelines" in identifiying PCD students. It would be important to attempt to identify (by means of *2
actual observation) the congruence between what professionals say they do and what they actually do. In a recent investigation (Ysseldyke, Algozzine, Richey, & Graden) we have shown a .19 correlation between teams of professionals' decisions to call a child LD and empirical evidence (test scores) to support the decision they made.

At the conclusion of Chapter 4, the authors observe that differences between districts in the percentages of students identified as PCD might be due either to (1) differences in rates at which psychological characteristics actually exist between districts, or (2) differences in local policies and practices that systematically and arbitrarily produce varying rates of identification. Our data (Ysseldyke, Algozzine, Richey, & Graden, in press) and data from Applied Management Sciences' national study of team decision making provide strong support for the second possibility.

Data presented in Chapter 5 provide strong evidence for significant problems in assessment practices currently used to identify PCD students in Colorado. While the problems are not unique to Colorado, they have strong policy implications. I was surprised to learn that 24% of the students enrolled in Colorado's PCD classes had not been given an achievement test. This simply should not happen. As noted in Chapter 3, most Colorado professionals believe a significant ability-achievement disparity is characteristic of PCD. How, then, can 24% be placed with no data on achievement? As an aside, I might again note that this kind of thing doesn't happen only in Colorado. We recently surveyed a private school for severely LD students and found that [redacted] 94% of the students demonstrated no ability-achievement discrepancy.

The investigators' findings on assessment lend strong support to the conclusion that in Colorado, as well as nationally, technically inadequate assessment is the state of the art. Table 5.4 clearly contains data indicative of the fact that the majority of professionals hold incorrect judgments on the reliability and validity of currently used assessment devices. Like their counterparts throughout the nation, they apparently believe in cash validity (if a test is used widely and sells widely, it must be valid) and typographical validity (if a test is printed, it must be good).

I agree strongly with the summary statement to Chapter 5, that the "current investment in PCD assessment is enormous and unwarranted in light of the poor psychometric properties of most tests commonly used." I do not agree entirely with the statement that "unreliable tests, inappropriate use of subtest-based diagnosis, and unconfirmed hypotheses generated by clinical judgment all produce many false positives and thereby contribute to over-identification of PCD in Colorado. While I believe this is probably true, the more accurate conclusion would be that these factors produce misidentification. Our research has shown that about 40% of those evaluated are misidentified (Ysseldyke, Algozzine, Shinn, & McGue, in press), and that depending on the "cutoff" one selects, one may argue either over-identification or under-identification. It's little wonder there is so much confusion in this field.

change
made
p. 91

*3

Data on staffing presented in Chapter 6 again lend credence to the argument that there are significant problems in need of policy resolution in the assessment and identification of PCD students. The investigators show that over half of the students referred are placed, and that 83% of those for whom staffings are held are placed and served. One might argue that teachers are incredibly accurate in referring students. I would argue that (1) teachers' tolerance for deviant (different) behavior is narrowing and diminishing, and (2) placement teams operate under the presumption that there definitely is something wrong with students who are referred. Teams operate to do something to a student (place the student) in order to remove the burden of the regular class teacher. In this manner, they serve to put out "brush fires" in schools. The investigators provide data in support of this contention when they report that only 23% of currently placed students have evidence of a discrepancy between ability and achievement.

The chapter on costs provides evidence that the costs of current assessment and identification activities far outweigh the benefits of those activities. I would add that in most cases it could also be observed that current assessment practices serve only an administrative function, that is, they are largely relevant only to placement decisions and irrelevant to instructional planning decisions.

I now "stick my neck out" to make some overly strong statements, "attention getters," in the interest of stirring the investigators in their Chapter 10 to make some strong policy recommendations.

Current practices in Colorado in the assessment and identification of PCD students are based on a system of "institutional payoff" rather than "individual payoff." Assessment is engaged in for the purpose of declaring students eligible for services rather than for the purpose of deciding how best to serve them. The process is characterized by use of technically inadequate tests to provide the data on which eligibility decisions are made, and I suspect that the decisions are as often wrong as right, subjective as objective. One might hazard the guess that the entire assessment and identification process exists as a "smokescreen" to provide alleged objectivity to a subjective process in which students who experience academic and social difficulty can be removed from regular classroom settings. The process is based on the presumption that academic and social difficulties are due to within-student deficits, dysfunctions, and disabilities. The process keeps us from looking at instructional disabilities as a possible explanation for the failures of significant numbers of students to achieve. These statements are harsh, but hopefully they will facilitate action either to improve the process or to abort it in favor of spending more time and money on instructional efforts.

References

Ysseldyke, J. E., Algozzine, B., Richey, L., & Graden, J. Declaring students eligible for learning disability services: Why bother with the data? Learning Disability Quarterly, in press.

Ysseldyke, J. E., Algozzine, B., Shinn, M., & McGue, M. Similarities and differences between underachievers and students labeled learning disabled. Journal of Special Education, in press.

Notes in response to Dr. Ysseldyke's review:

*1. This point is well taken. There are, of course, numerous research studies on the characteristics of LD children some of which have tried to address the distinguishing features of LD and normal children. However, most studies are not selected to be representative of legally defined populations of LD children; therefore, it is difficult to talk about interpretable proportions who are LD or normal or better described by some other characteristics.

*2. We do not have extensive data on this point. However, differences in stated district policies were examined. We have not given attention to this after Chapter 3 because we found that virtually none of the important differences in prevalence (Chapter 4) or validity of identification (Chapter 7) could be tied consistently to formal criteria. Differences were apparently due to implicit rather than explicit variation in criteria.

*3. The Chapter 5 summary was altered in accordance with this point. Our conclusion was based on the findings of actual PCD pupil files in Chapter 7 as well as on the unreliability of measures. Also, given the relative rarity of the trait, we would expect more false-positives on purely statistical grounds.

REVIEW OF: EVALUATION OF THE IDENTIFICATION OF PERCEPTUAL-COMMUNICATIVE DISORDERS IN COLORADO

Betsy Anderson, MA
Denver Public Schools
IPCD Teacher/Consultant on Woodcock-Johnson Psycho-Educational Battery

February 12, 1981

I feel that to more successfully meet the stated purpose, "to describe and evaluate the procedures used for identification, assessment, and placement of PCD pupils in Colorado, " the description and evaluation should have been parallel studies rather than combined because it seems totally unfair to evaluate a program that is dependent upon state and federal guidelines that have changed repeatedly and are sometimes in conflict with one another. The laws have remained similarly vague, but the interpretations of the laws have changed and the guidelines from which districts are to model their programs have changed.

I feel that some of the inferences made within the report, especially those pertaining to the survey of professionals, Table 3.2, are invalid. Many factors contribute to the determination of a Perceptual Communicative Disorder, therfore to judge each factor identified as a "positive indicator" individually is unrealistic. Some recent studies have cited poor pre and post natal care, poor nutrition and an overabundance of "junk food" as contributers to learning disabilities. These conditions seem to be more prevalent in low-socio-economic homes. This may have influenced some professionals to indicate "socio-economic disadvantage" as a positive indicator for PCD.

I think it is very pertinent to know when the case files were originally staffed into PC. Since the requirements have varied over the last five years *1
it seems senseless to expect the files originally staffed under different

guidelines to fully comply with the new standards. Also, as stated in this study it is almost impossible to specifically determine a processing disorder, yet the lack of valid testing for such was cited as one of the most common missing element in the review of the case files. With no testing instrument available to reliably assess processing disorders, how can the state hold districts accountable for that type of evaluation?

The Woodcock-Johnson Psycho-Educational Battery was the only test listed that attempts to assess more than one area, including processing, and that was rated highly in all three catagories of Table 5.5. I was amazed to find it omitted in the review of tests, hopefully, this occurred only in my packet. The Woodcock-Johnson may be able to fill some of the void in the field of valid assessment. *2

I think it is only fair to mention that the largest state educational institutions have been instructing potential PC teachers in the use of many tests that this study has judged as invalid. Every time a teacher is hired with this type of testing background the possibility of unreliable and invalid placements increases.

I feel strongly that this study reveals some very real problems in the statewide PC area. I think there is a desperate need for standardization throughout the state in the areas of identification and assessment. I was appalled to read that some pupils were placed without a psychological evaluation.

I feel that the only realistic path toward standardization depends upon the coming together of the state and federal governments on their interpretations of the law and for those agencies to recommend *specific* assessment procedures and instruments that would meet their requirements. To further aid the standardization I think the state should consider recommending that diagnostic teams are used to evaluate pupils referred for PC screening. This would allow educators in the PC field to specialize as either a teacher or an evaluator, hopefully this would help improve both aspects of the field.

I would hope that this study is used to help upgrade the PCD identification and evaluation processes throughout the state rather than as an excuse to limit funds in the PCD area. There are numerous PC pupils that have been identified and evaluated properly and are now benefitting from a PCD program without which their school success would have been doubtful.

Notes in response to Ms. Anderson's review.

*1. We did do many analyses by date of initial staffing. We did not report most of them because they did not substantially alter the picture obtained from the overall analyses. For example, adequacy of record keeping at staffings is reported by year in Chapter 6. This analysis does show an improving trend over time but not as great as one would expect.

*2. We did not review the Woodcock-Johnson Psycho-Educational Battery because it appeared in only 6% of the PCD pupil files and therefore is not one of the more frequently used tests.

REVIEWER COMMENTS ON PCD IDENTIFICATION STUDY

Reviewer: James A. DeRuiter, Ph.D.
Associate Professor
Chairman, Department of Special Learning Problems
School of Special Education
University of Northern Colorado
Greeley, Colorado 80639

Chapter 1

1. Introduction section quotes only those who see the definition problem in a negative way, thus setting a negative tone to the report. Expert clinicians can do much better than this. Cruickshank, Kass, Chalfant and King have in various places (see references) operationalized definitions. The problem is really not with vagueness or uncertainty, at least among top level professionals, but with diversity of interpretations. The section greatly oversimplifies the question and is far more negative than it should be. *1

Chapter 2

2. Section on Reliability and Validity of Case File Analysis - "% Discordance" figures in table under "reliability" are reversed for the first two entries. correcte p. 15

3. Qualitative Analysis section: categories. Are Drs. Smith and Shepard trained and experienced specialists in learning disability? I question the ability of even highly trained clinicians to make judgments about the last three "categories" (Marginality of Placement, Necessity for Special Education, Cluster) on the basis of written case study data alone. If the evaluators are relatively untrained, the judgments are extremely questionable.

Chapter 3

4. Discussion of Table 3.3, under topic Correlates of PCD. How does your former designation of "important factor" become a "slightly positive indicator" in this section? Also, if the numbers you list in Table 3.3 (Items 7, 8, 9) are representative, it would be more accurate to say that professionals tended to consider these as critical or important factors. In 3 of 4 cases, the sum of critical and important percentages exceeds the sum of important and neutral percentages. Social workers are the exception.

5. Chapter summary (and Exclusionary Factors section). I suspect the questions in the questionnaire were incorrectly formulated or misunderstood by some respondents, leaving to the results you obtained. All might agree that if the problem were predominantly in another area (e.g., linguistic differences) a learning disability is not indicated. When you say the linguistic differences "probably explain the learning problem" and the child "should be excluded" you are asking for two sets of judgments. Therefore, I seriously question the conclusions you draw about this area.

Chapter 5

6. I find it incredible that you give a test (the ITPA) "an exceptionally low grade to call attention to its failings for current uses made of it." What is this, a witch hunt? If someone misuses a test you blame the test? An exceptionally unprofessional approach that leads me to question your judgment. Yes, the test is inadequate in many ways, but your biases are showing. *2

7. Your conclusion about clinical judgment (underlined on last page of chapter) strikes me as a statement of vague suspicions, unsupported by substantive data.

8. The last statement in the chapter is patently false. You suspect false positives are many, but unless you know how to identify accurately, how can you know if there are any, many, or none? The statement is simply unsubstantiated. *3

Chapter 7

9. Identifiable Subgroups section is interesting. Perhaps a question should be raised about whether judgments of this sort are even close to being as reliable and valid as judgments made by a group of professionals who know the child. Inaccurate or incomplete records obviously could play an important role in the decisions made about subgroup membership. The section tends to leave the impression that the people who wrote the report know the truth about correct classification and the staffing committees knew less. Obviously, the opposite would tend to be true, if for no other reason than personal knowledge of the students by the latter. *4

10. So! You judged 60% of the kids needed special education help. On what basis? Who are you to say? Why is your judgment any better than a staffing team of professionals? A discerning reader will wonder if the meaningful conclusions you reach are worth anything if you keep up this kind of thing.

Overall Impression

The report strikes me as a mixture of unsupported editorializing and acceptable research put together by someone with certain preconceptions about the field. It is not surprising, of course, when preconceptions are emphasized in interpretations of data. It is somewhat dangerous if the editorializing is done under the guise of research or gives the impression of being fact when it is really opinion.

Incidentally, my own biases are sometimes similar to those reflected in the report. I think criteria for identification are generally not stringent enough. I believe many people identified as learning disabled in public schools really are not (by my "strict" definition). I am not at all comfortable with the way some conclusions were reached in the study, however, even though they match my biases.

References

Chalfant, L. C. & King, F.S. An Approach to Operationalizing the Definition of Learning Disabilities. Journal of Learning Disabilities, 1976, 9, 228-243.

Cruickshank, W. M. Learning Disabilities in Home, School and Community. Syracuse, N.Y.: Syracuse University Press, 1977.

Kass, C.E. Identification of Learning Disability (Dyssymbolia) Journal of Learning Disabilities, 1978, 10, 425-432.

Notes in response to Dr. De Ruiter's review:

*1. We cite the Chalfant and King article. Interestingly enough, it starts with an introduction similar to our own, pointing out the limitations of existing definitions and critera. The checklist which they propose may well be a step in the right direction. It is operationalized. It does not, however, have any empirical validation evidence.

*2. The American Psychological Association (1974) Standards for Educational and Psychological Tests specifically state that validity is not an inherent property of a test. Rather tests must be validated for the specific purpose to which they are put.

*3. We changed the statement in Chapter 5. Unreliable and invalid tests lead to misidentification. The data in Chapter 7, however, suggest that the tendency is for overidentification.

*4. We were careful to make the distinction throughout between missing data and data that were there but did not fit any of the criteria for PCD.

References: Standards for Educational and Psychological Tests, Washington, D. C., American Psychological Association, 1974.

EVALUATION REPORT
Dr. Joan M. Fairchild

The "Evaluation of the Identification of Perceptual-Communicative Disorders in Colorado" shows strict adherence to the best research techniques, depth and preciseness in both its conduct and in the presentation of the final report.

The study as reported is abrupt and leaves particularly the non-professional reader (the legislature) without any theoretical rationale, statement of significance or review of the history of the field or of the literature. The findings of the study cannot be viewed in context without some understandings concerning the history of learning disabilities. Unlike most other disabilities served by special education, learning disabilties is lacking in a historical field of literature or of teaching techniques. Little evaluation or remediation was attempted for "brain-injured" children until the early sixties. When parent pressure became strong enough to make impact on the professions, many different people began to look at the field and to study the causes, the techniques of evaluation and the possibilities of remediation. For what ever reasons, this field captured the imagination of many different professions. If occupational therapists had been part of staffing teams, another body of evaluation techniques and remediation possibilities would have been discovered. Each professional group has felt it was the only one qualified to test and to make clinical judgments. Learning disabilities is not different from any other problem which attacks human beings. No professional group feels a part of a peer team. Each wishes to prove to the other that her contribution stands above that of the rest. Having spent several years on the faculty of a large medical school, what has happened in learning disabilities is in no way unusual. The literature reflects this inability to work together. [illegible] and books produced by each profession often fail to acknowledge that [illegible] in any other. In fact, the literature is often so different that it is difficult to comprehend that each is writing about the same disability.

Another problem which has plagued the field of learning disabilities is that it is perceived by some as an "acceptable" handicap. Professions that have not been interested in the "less desirable" handicaps have found this one interesting. Parents have found it much more desirable to have a child with a learning disability than to deal with mental retardation or with a slow learner. Over the last few years members of the legal profession, backed by some in psychology and education, have suddenly discovered that incarcerated children are learning disabled. The popularity of this handicap with those working in the correction field has become so great that the U.S. General Accounting Office financed a study to determine the numbers so afflicted. The results of that study indicated that ninety percent of incarcerated youth had severe learning problems but that actual learning disabilities could be determined for only twenty-five percent. Part of this extreme reaction to learning disabilities may have come from the many years when psychology and psychiatry saw only behavior as being significant for children in trouble.

The study has a clear statement of purpose and this purpose is maintained throughout the report. The sampling techniques seem excellent. The care with which they were developed plus the unusually high return of questionaires would insure a most accurate study.

It is not possible for the reader to conclude whether the research used any control to determine if change in record keeping took place between August 1980 and December 1980 as a function of awareness of the study on the part of school districts.

One of the strong points of the report is the clear discussion of definitions. The technique of asking for definitions from the involved professionals gave clearly the amount of agreement between Colorado professionals, state and federal guidelines, definitions of well-qualified professionals at the national level and the definitions actually adhered to in staffing practices.

The difficulties with valid and reliable evaluation instruments have been well known and documented in the field for at least twenty years. This has been due in part to honest searching of well-qualified professionals to find techniques which would pinpoint specific problems in these widely diverse children and, since the passage of Public Law 94-142, a tendency on the part of some to enjoy the profits from the sale of beautifully produced instruments that lack the lengthy procedures for determining validity and reliability. School districts often set testing practices without reference to validity, reliability or appropriateness to sample. In addition to the evaluation of testing instruments given in Ysseldyke and further elaborated by the Final Report, there has, within the field, been little attempt to consider "goodness of fit" of even the most reliable and valid instruments to the learning disabled population.

It comes as no surprise that professionals, although believing that a processing deficit is an important indicator of learning disability, have not shown evidence of this consideration in staffing practices. There are few techniques available or known to evaluate or remediate processing deficit.

There are two other factors to be considered in looking at the findings of this excellent study. The research that has come as a result of the evaluation of Title I has shown that often results cannot be determined through short-term research. Perhaps human research is only valid if it is longitudinal in nature. Before we can determine the outcome of programming for learning disabled students, we may need to follow those students over a period of years.

The other factor is to consider the present programming in the public schools. The only program generic to public education is that for the "normal" child. There has been little proper programming for the slow learner or the gifted. The few alternative programs which exist are often placed outside the school in poor physical facilities. The outcome for the slow learner is that he is often lost, has a high rate of drop-outism, develops a poor educational self-concept, etc. The fascinating case studies which are presented as part of the final report may show an attempt to provide programming even though that programming is inappropriate.

The study touches only briefly on the outcomes of remediation indicating that teachers did not report that learning disabilities had been remediated for those staffed out of programs. The literature indicates that a learning disability is not always something that can be "cured", but rather is a disability that may show different presenting symptoms as the child matures. This points to the need for periods of remediation throughout the school program.

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TO: Dr. Lorrie Shepard
Laboratory of Educational Research

FROM: Stephen E. Hodge
Coordinatory, School Psychology Program

RE: Review of Preliminary Report of Findings - PCD Identification Study

DATE: February 12, 1981

My overall reaction to the paper is quite positive. In most respects the report reflects an exemplary study methodologically. The sampling procedures are particularly well articulated, the procedures for analyses are relatively clear, and the categorization systems and descriptors thereof will undoubtedly be of considerable value for further research and practice in this field.

Undoubtedly there will be questions about whether the PCD cases were truly typical of those in the population, whether the professional personnel in the survey group and the staffing sessions were truly typical in regard to preparation and experience, whether the information available to the authors was sufficiently inclusive to permit adequate assessment of the decision-making process with PCD's, whether the instruments developed by the authors of the study were any more valid than those criticized by the authors relative to the PCD identifications, etc.

Everything considered, it appears to this reviewer that all reasonable efforts were made to account for error and to reduce its influence.

As to the accuracy of the findings, information regarding such items as the general procedures for referral and identification, the number and type of instruments used by various personnel, the nature of staffings and reports, and the information on categories and the numbers placed in those categories, are generally consistent with this reviewer's expectations.

I do have some concerns about conclusions drawn from the findings and what influence these conclusions may have on policy decisions.

It could be this reviewer's bias, but there did appear to be an emphasis on the conclusion that "many more children are identified as PCD than show any true symptoms of that handicap" and that the solution should rest with "better" psychometry because "faith in clinical judgment may be misplaced." "Unreliable tests, inappropriate use of subject-based diagnosis, and unconfirmed hypotheses generated by clinical judgment all produce many false positives and thereby contribute to over-identification of PCD in Colorado."

It is probably true that PCDs are over-identified in Colorado since the study rather clearly makes the point that official criteria are not being followed appropriately. It is quite another subject to conclude, through implication, that the solution would be to let PCD identification rest primarily on scores from a selected few "A" rated tests. *1

Hopefully, the committee's professional members and parents in staffings do not believe that their primary responsibility is to come to agreement with or attest to the validity of test scores. Rather, they should see their responsibility in accounting for the unique characteristics of children by integrating multiple pieces of information, including psychometric information, in attempting to decide on the best match between their child's characteristics and the type of intervention. If errors are being made in the placement of, or identification of, PCD or non-PCD children, then attention should be turned to a review of the reliability, validity and standardization of the primary decision-making instrument: the committee.

In this regard, it is apparent from the report that committee members are not applying official criteria appropriately and instruction to do so is well called for.

Also, it is noted that members may not be adequately informed about the characteristics of normal versus exceptional children on a number of dimensions. This is not completely the fault of the professionals, though, inasmuch as the professional literature is inadequate in providing this type of information and many districts do not provide adequate options for professionals to keep up with the literature on a regular basis.

Professional committee members should not be excused for being uninformed about the technical adequacy of instruments they administer. Considering the time loss and the cost of multiple testing with unreliable tests, I would generally agree that clinicians should be aware of which instruments make the primary contribution to their decisions and attempt to reduce the number of tests administered. Rather than imply that a given number of "A" rated tests be given, though, it is more reasonable to recommend that adequate justification be given for the instruments used. The authors do not mention, for example, that the clinician may be administering any number of tests because of their concern with the subject's ability to respond to items within a unique format or their desire to observe the strategy used by the child in coping with a variety of problems; there may be no intent to use the score from any of the scales.

The committee members also have a responsibility to present empirical evidence for their decisions, as suggested in the report, but it should be understood that "empirical" does not mean only "psychometric." The authors mention that issues such as specific demonstrations of instructional failure, reliability and validity of tests, adequacy of clinical judgment, are seldom mentioned in reports of staffing decisions. I certainly agree that discussions of the specific bases for decisions and and evaluation of evidence is the responsibility of committee members, but it may be false to conclude that these items are not considered. More frequently, clinicians are given exceptionally limiting instructions by their supervisors regarding the length of presentations on given cases, and are even actively discouraged from presenting even minimally adequate statements of their findings, let along the basis for their professional judgments.

I would prefer to conclude that emphasis should be given to enforcing existing standards relative to the identification of PCDs based on the findings of this study.

Notes in response to Dr. Hodge's review:

*1. We agree. Valid identification of PCD must rest on both reliable and valid tests and reliable and valid judgments.

To: Lorrie Shepard, Ph.D., Principal Investigator

From: Margaret L. Lemme, Ph.D., Associate Professor,
Department of Speech Pathology and Audiology,
University of Denver

Re: Review of Preliminary Report of Findings

The "Evaluation of the Identification of Perceptual-Communicative Disorders in Colorado" is, in my opinion, an excellent study which substantially advances our empirical knowledge and has the potential of increasing the degree of order in the state of the art. The design of the study, which is presented clearly, is thorough and well chosen. Control of extraneous variables and threats to generalizations is included. The methods of securing adequate and proper data as well as appropriate data analysis are noteworthy. Inclusion of multiple methods - quantitative and qualitative analyses - increases the confidence to be placed in the accuracy of the major convergent findings.

In chapter 3 of the study, the investigators develop the key elements in the various state and federal definitions, and their inherent problems, quite well. While the definition of specific learning disability in the current regulations accompanying P.L. 94-142 includes both disordered psychological processes and language, my experience suggests the most popular and widely accepted working conceptualization is that most learning disabled children sustain perceptual dysfunction. This conception seems to be highlighted in the current study by the inclusion of a section on perceptual disorder, with the exclusion of a section on communicative disorder. Working from a frame of reference as a Speech-Language Pathologist, I am concerned about the interpretation of language dysfunction and how it interfaces with current Colorado PCD policy. Wiig and Semel have subdivided the complex act of processing auditory language into 3 levels; (1) the perception of the sensory data, (2) linguistic processing of the phonological, morphological and syntactic structure and semantic aspects, and (3) cognitive processing of auditory-symbolic and semantic units, semantic classes, semantic relations, semantic transformations, and semantic implications (1976, p. 24). They note that normal language processing takes place simultaneously at all available levels of analysis. My concern is for those children who potentially demonstrate "language interference" or depressed verbal abilities and language achievement which is not restricted to the perceptual process and/or English as a second language. My intent is not to contribute to territorialism, but to increase interdisciplinary understanding and cooperation, and appropriate pupil services.

IMPLICATIONS of Major Findings:

Policy.

1. Operationalize Colorado definition of perceptual and communicative disorders (PCD) and standardize criteria (valid, reliable instruments) that guide identification of PCD pupils.
2. Decrease overinclusive identification of PCD which distracts from the original intent of special services for specific learning disabilities.

   (Differentiate among various conditions which lead to depressed learning or achievement, e.g. teaching, low-motivation and under-stimulated home environment, and provide appropriate services.)

3. Operationalize definitions and standardize criteria for subgroups within PCD population served.

4. Provide interdisciplinary administrator, teacher, and clinician training programs in areas of need:

    a. psychometric considerations of test instruments (validity, reliability) and test interpretation issues
    b. normal development and norms
    c. cross referenced tests, abilities, and terms
    d. current theory and research applied through use of case studies and staffing implications

Further research, basic and applied, is warranted.

Reference:

Wiig, E. H. and Semel, E. M. Language Disabilities in Children and Adolescents. Columbus, Ohio: Charles E. Merrill Publishing Co., 1976.

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8 FEBRUARY 1981

REVIEW OF PCD IDENTIFICATION STUDY REPORT

(All chapters except 10 were available to the reader.)

The State of Colorado PCD study, directed by Dr. Lorrie Shepard, is important and timely. It addresses one of the major issues in special education: PCD. It is conclusive in regards to the identification, assessment, and placement processes used for PCD students. It talks about the numbers of PCD students, and it raises issues that must be addressed before legislative action is taken regarding the numbers of PCD students in Colorado.

The Study

Methodology and Reporting

The methodology of the study appears to be adequate. It uses a broad range of techniques (questionnaires, interviews, case reviews, state and federal data, and research references.) The research references are particularly noteworthy.

The reporting is excellent. It is readable; its language is clear and free from the argot of the educator. In most areas, the points made and the data are consistent and not subjective. Exceptions are: a) the references to PCD's being labeled differently, thus suggesting a simple reduction of incidence; b) hyperactivity being diagnosed adequately by a physician outside of the classroom environment; c) attentional systems being related to behavior, but unrelated to PC; and, that PC is a single handicap unrelated to another. *1

Accuracy of the Findings According to My Knowledge

The findings appear to me accurate, based on my knowledge. That is, the tests described are those that are commonly used by staffing teams; the numbers of people attending staffings and the numbers of reports written for staffings are reasonable; the variation in the incidence of PCD is real, varying as it does according to the classroom,the school, and the District. The difficulties of the assessment processes are well described, especially so-given the contrivance of "processing", the troublesome notion "discrepancy" and the impurity of the exclusionary areas (e.g., EMR).

Conclusion

The report concludes that there are too many PC students in the State of Colorado; but not how many is too much? In relationship to the total number: Is too many 55%, based on those PC students who did not demonstrate significant discrepancies? 65%, based on those who were marginal placements? 79%, based on those who could be more appropriately assigned to another cluster? Or, 41%, based on those who are truly PCD (i.e., nothing else) as in Table 7-8? The report also grades the assessment process instruments as well as clinical judgement and analyzes the definitions of PC. These are the particular strengths of the report. Regrettably, the report does not address either termination or the efficacy of instruction although the concerns are suggested by the research questions. An attempt is made in the report to regroup PC students into other groups (clusters); this attempt appears to deny the possibilities of other sources of PC and does not appear to be based on data.

Policy Implications

The report attributes the large PCD population in Colorado to the fallibility of the assessment process, namely to the unreliable tests, use of subtests to define discrepancy, and inadequate clinical judgment. That the assessment process does not identify the data required by the state definition of PCD is unmistakable; that the definition requires the assessment teams to find what doesn't exist is not made clear. The assessment teams are cited as having artificially created a variability without acknowledging that the disability itself is ambiguous and amorphous. Thus, the first policy implication becomes this: the definition of PCD must be rewritten to incorporate realities that can be assessed and are related to instruction (e.g., having baselines instead of processes).

The second policy implication, broader than the first, is that the importance of the environment in which the referrals is made must be recognized, identified, and measured. For example, according to the report, nearly all referrals are teacher made, but the reasons for the referrals is not recognized. Referrals appear to be made because the teacher most likely expected a different performance from the student than the student exhibited. (It could be that variability of PCD is due to each teacher having a different expectancy rate regarding the performance of the students in the classroom.) A second reason to assess the environment: assessment teams function within the social systems of the schools; yet, the impact of these systems on the decision making required in the assessment process has not been addressed. Their impact is forcing recognition when Dr. Shepard conclues that the differences in incidence are "due to local policies and practices that sytematically and arbitrarily produce varying rates of identification". Given that, the next step is to analyze those local policies and practices, especially the unwritten ones — the social norms.

The third implication is that the training institutions as well as the hiring institutions must organize and offer preservice and inservice programs regarding the entire assessment process immediately. The assessment chapter alone sets that direction and forces those actions. More, those institutions must develop immediate parent information and communication programs. Parents need to learn of the fallaciousness of the assessment process as well as its unproven assumptions now. To continue without correction is to offer inaccurate, inadequate, and potentially harmful information when the opposite is known; this is unethical.

A final implication for policy makers is that the students, whether labeled PC, will continue to be within the schools. Their needs will not fade with a directed reduction of the numbers, should that step be taken by the legislature. Thus, the alterations required within the educational system for these students must be identified, and the delivery of the alternatives supported and secured before the educational system in total can meet the needs of all its students. The problem may not be the numbers of PC students; the problem may be the system that identifies them.

Respectfully submitted,
Eleanor Lowrey
Dr. Eleanor Lowrey

EL/ptp

Notes in response to Dr. Lowrey's review:

*1. There is a possibility that the procedures for the quantitative analysis in Chapter 7 were not clear. Valid identification of PCD does require interpretation of multiple signs. The cases identified as "true PCD" in the computer analysis tended to have several indicators. The children called "hyperactive" were placed in this group only after they had failed to show any of the criteria for true PCD _except_ hyperactivity. This was then the best way to describe their presenting characteristics. Children who had signs of attentional disorders or hyperactivity but who also had other signs of PCD were called "true PCD." The rule to always place cases in the PCD subgroups before considering them for any other group was referred to as the "hierarchical design rule" or the "benefit of the doubt rule."

PCD IDENTIFICATION STUDY REVIEW

The study provides thorough and well developed data in the area of diagnosis and placement of PCD students. The quantitative and qualitative analysis brought out important salient factors while the practical nature of assessment was reflected in the case samples. This process along with the style of writing used made the report easily understood. The lack of thorough information on intervention for PCD students or other students evaluated but not placed should be acknowledged. Cost factors that have been wholly attributed to assessment alone are in error when the interlocking nature of assessment and intervention is not addressed. Research is of value only as it supplements and relates to the total configuration and complex questions of how school districts are to meet the needs of their students and especially those students who are having learning difficulties for whatever reason.

Specific areas in which findings where questioned related to the following:

1. Questionnaires:

- The exclusionary nature of questions did not reflect consideration for the possibility of existence of a dual or multiple handicap.
- Questions eliciting information from teachers and other staff on the value of assessment information from various team members for the purpose of developing intervention strategies would provide a more accurate picture of dollar value derived from the assessment process.
- Unlike other discipline members, questions relative to testing were not included on the questionnare completed by social workers. Questions should have been included that generated information on what assessment tools are used to complement clinical judgement. There is some use of adaptive behavior instruments such as the AAMD and SOMPA. As a mandated part of assessment, adaptive behavior provides valuable insights into the child's maturity, independence, and coping skills within his social and physical environment. Whole social work information is crucial to the process of identification of a handicap. It is equally critical to establishing student needs in the affective area of IEP during the staffing meeting. *1

2. Evaluations of tests, Test Interpretation and Clinical Judgement.

- A distinction has been made on tests indicating value in diagnosis vs. value in planning intervention. A more accurate reflection of evaluation activities and their respective merits would have been accomplished if a distinction would have been similarly delineated in the area of clinical judgement and informal assessment procedures. Attention to these factors would have illuminated the impact of social and emotional factors that impinge upon the learning process.
- The delineation of tests used that are not valid, reliable and appropriately normed was valuable. Fewer tests combined with clinical judgement and informal assessment data would achieve equal accuracy with greater efficiency and increased utility for post staffing interventions.

3. Inappropriate placement in PCD.

- References to EBD handicapped youngsters in PCD could be a reflection of program placements in the least restrictive environment of students with dual handicaps of PCD and EBD. PC resource room placement for the PCD handicap coupled with itinerant level services from the social worker or psychologist in working with the EBD handicap are not an uncommon arrangement to achieve programming in the least restrictive environment. *2

4. Cost

- Discussion of cost factors should not be restricted to assessment and placement. The extended value of assessment data in establishing a basis of intervention within the special education program is equally important.
- For students not placed in the special education programs, the evaluation still serves as a guide to the utilization of other educational programs in the district and alternatives for regular classroom intervention. The cost of the evaluation is offset by the utilization of information in planning for the individual student whether in special education or not.

Policy Implications.

There could be both positive and negative policy implications from the findings of this study depending upon the point of view of the reader and the use to which the findings of the study will be implimented. Since the chapter on findings and evaluative issues was not available for review it was difficult to address these in logical order and one can only make inferences about some of the results.

1. Figures presented in the study reflect that a high percentage of students are inappropriately placed in PCD.

   Possible implications:

   - Guidelines for PCD placement will become more stringent.
   - The narrow focus on evaluation and placement of PCD without a few relections on total special education programs could erroneously imply money is being "wasted" on inappropriate placements.
   - Some students are being labeled as handicapped who in fact are not handicapped.
   - PCD is being used as a "catch-all" for many other kinds of special education problems or general academic difficulties.
   - Assessment techniques should be refined and more training given to staff in identification procedures.
   - Guidelines should be relaxed in order to allow for proper placement of children who need academic help that they would otherwise not receive.

2. There is widespread use of testing and evaluation methods that are neither reliable nor valid for identification and assessment purposes.

   Possible implications:

   - There will be a search for better testing instruments.
   - More value will be placed on professional (clinical) judgement and informal assesssment data (task analysis).
   - Improved communication will be activated between test evaluators and those professionals utilizing the instruments.
   - Some districts will evaluate current assessment tools and make appropriate adjustments.

3. The cost of each PCD assessment is $500.00 plus. There is an inference that this cost is excessive.

   Possible implications:

   - Guidelines might be established which would condence and shorten the assessment procedure to make it less costly. This could also reduce the quality, however, and might increase the risk of students being misplaced in the program.
   - In implying that the cost is excessive, the study does not take into account the value of the assessment for remediation and treatment plans whether the student ultimately is or is not placed in the PCD program or in another special education program.

4. There is overlapping of data gathered by the various disciplines involved in assessment and this data lacks professional consistency. This is percieved as a negative factor by the researchers.

   - The perception of professional inconsistency as a negative factor may obscure the positive value of converging data from different disciplines. Divergent viewpoints often facilitate differential diagnosis and insure that the total needs of the student have been considered.
   - If it is determined that overlap of data and differing professional judgements are unnecessary and inefficient then the best interests of the child would not be served.
   - Reference is not made to the fact that the staffing process often brings divergent information into an effective plan addressing the "total" needs of the child, even though individual reports may present differences.

Reviewed by: Anne Mitchell, ACSW, LSWII
National Association of Social Workers

Notes in response to Ms. Mitchell's review.

*1. Our limited pilot experiences indicated that many social workers did not feel comfortable responding to a section on formal tests. (They would often refer us to another professional.) The SOMPA and AAMD were coded in our analysis of case files and occurred in less than 2% of the PCD pupil files.

*2. Of the cases identified as EBD in the quantitative analysis only 20% were receiving some sort of social work or psychological services.

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School of Education

REVIEW OF THE FINAL REPORT
OF
IDENTIFICATION OF PERCEPTUAL COMMUNICATIVE DISORDERS IN COLORADO

Kenneth R. Seeley, Ed.D.
Coordinator of Special Education

Overview

This study was an important first step to provide a data-base for decision making regarding definitions and procedures for children who have been identified as having a perceptual/communicative disorder. These children are known nationally as "learning disabled" and present the same professional dilemmas in other states as they do in Colorado. The section on definitions (Chapter 3) adequately summarizes the best of what is currently in use today. We still need better guidelines to operationalize a definition which is defensible educationally. This is problematic throughout the study when conclusions are drawn and implications made about "P.C.D." children. It is important to this reviewer that readers of this study be cautioned that the labels and descriptors are too often ambiguous, vague, and compound on each other to the point of confusion. Semantics are always an issue in communicating accurately. However, the field of learning disabilities is in such a disarray that semantics of terms are even more prone to convolution and misinterpretation. I do not

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fault this study for describing results and definitions in the common jargon of the field. I would only add that a reader must approach the terms, definitions, and educational prescriptions with the understanding that they may at best be ambivalent and at worst meaningless. Most of the instruments and measurement procedures used in the field of learning disabilities are best described as primative. This further contributes to the problem.

The Methodology

Perhaps the greatest strength of this study was the methodology employed. It was well-conceived, appropriately applied, and sufficiently broad-based to give input from a variety of perspectives. I believe the researchers should be commended for their thoughtful and thorough treatment of a research problem that is sufficiently amorphous to frustrate some of the finest scholars in special education. It would indeed be worthwhile to replicate this research design on a national level. In summary, then, I believe the methodology is sound and is only flawed by the ambiguous jargon of the field and the primitive measurement procedures used to identify the population under study.

Impressions and Implications

The impression of this reviewer is that the study pointed out significant problems in identification, assessment, placement, and services relative to a very diverse group of learners who experience problems in school. From an ethical position I do not believe any placements are made in order to generate more income from special education funds. Rather it seems that children who are called P.C.D. have a range of learning problems that need some attention. The issue is from where that attention should come.

The inescapable inference that should be drawn from this study is that too many children have been labeled inappropriately by well intentioned professionals operating in a system that feeds on itself. These children have problems. However, the educational system must broaden alternatives for different learners beyond special education.

Inferences from the Study

The following inferences were drawn from reviewing the study:

1) The regular classroom teacher must serve a larger role in the educational programming of children who experience learning problems.
2) Referrals to special education should be a last resort, not a first step. All resources of the regular education program should be exhausted before a referral is initiated.
3) Current identification and assessment procedures are woefully lacking and inconsistent if there is an expectancy of creating a homogeneous group for this categorical special education program.
4) Too many children are being labeled P.C.D. by a system of education that is disabled. The problems are system-based, not intrinsic to the child who is identified. Poor teaching, lack of appropriate materials, lack of instructional alternatives within regular classes all contribute to disabling the system and sending a child off to a P.C.D. program which has a history of serving any and all who do not fit the regular program.
5) If many children with learning problems are going to be denied access to special education due to some policy decisions to "tighten" criteria and definitions, then some alternatives have

got to be generated other than "dumping" them back into general education. Some alternatives might be inservice training, preventative teaching and intervention before referral to special education, and more flexible utilization of special education personnel working with regular teachers to combine resources.

Summary

This reviewer believes that the general findings of this study are an accurate picture of the status of programs for P.C.D. children in Colorado. Some may find the results shocking and others may discount the study. However, it is undeniable that special education programs for P.C.D. have gone far beyond good educational practice, with all the best intentions, to serve the needs of every child with a problem. We must shift much of the burden back to the regular classroom teacher. However, this cannot be done only by legislative fiat. There must be a planned, systematic program of re-definition of roles and responsibilities and the commitment of special educators to work within the general education enterprise as a support subsystem.

We must not lose the children as we generate the mechanistic behavioral analogs that seem to constitute "defensible" categorical programs in education. The problems of these youngsters will not go away because we change the definitions. It is possible to find better, less costly alternatives to our current practices in P.C.D., but we must never forget the children.

February 6, 1981

Dr. Lorrie Shepard
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Dear Dr. Shepard:

May I take this opportunity to respond to your kind invitation to review the copy in regards to the perceptual communicative evaluation. I have had an opportunity to share this with several of our staff and these are some composite responses.

1. The overall report is very comprehensive in depth and reflects a great deal of work and the statistical analysis is outstanding.

2. We would recommend that more effort be expressed in the report in regards to definitions and the confusion that is taking place in the state and in the nation around definitions. Even though you may find those in a written format, people's perceptions and interpretations vary to such a great deal, plus the amount of bureaucrats that give their reflections, that it makes it next to impossible to implement a clear definition at the local level.

3. The chapter that dealt with assessment is so important as it clearly reflects, in our opinion, one of the major issues with servicing handicapped students. The inappropriate instruments that are on the market and being used by professionals, plus the wide range of perceptions as to the assessors and their use of these instruments, is clearly indicated to be less than adequate, not only by your data but Ysseldyke's information too. Therefore, we feel that this document needs to make some pointed comments as to the responsibility of the training institutions (colleges and universities) as these are the responsible parties for the conceptualizing of the minds of assessors before they hit the school districts. We are finding it next to impossible to argue with our professionals when it comes to the use of appropriate instruments because they say this is what they were trained to do at the university level.

4. Another point we feel needs to be stressed is that we feel that many students are deliberately mis-identified for now because services tend to go with the label of a student. We feel that

because of the strictness in reimbursement and the categorical labeling within the State of Colorado, we are forced not to meet needs of students but to try to fit students to programs. Therefore, when staff members see a need of a student being one way and the program being another way, they may twist and bend the assessment data to force a student into what they feel is the most appropriate delivery system even though it does not comply with strict regulations when it comes to identifying the handicapping condition.

5. The report makes constant reference about the perceptual processing nature of the remediation offered within the PC classroom but does not address the need for study skills or a compensatory approach or a cognitive processing approach that may be needed in this area.

6. We feel that the report has so much information but the authors stop short as to coming to a clear conclusion and finger pointing to the problems in regards to PC. Therefore, we encourage you and your staff not to be timid or bashful but really call it as you see it and point out clearly to the legislators what issues you see are facing us, not only in the PC program but in special education.

Again, thank you for the opportunity to respond. We hope our comments will be helpful and if we can be of any further service, please do not hesitate to call.

Sincerely yours„

Chapter 1

The introduction does not provide a complete and accurate description of the Learning Disability field. Instead, it focuses on the negative aspects of the field. It attempts to impair the credibility of both the state and federal definitions. The implication that a major fault of state and federal *1 law is their inability to prevent mistakes in the placement of LD or PCD children is ridiculous. No law will prevent mistakes or errors in judgement. For example, a blind child is easily indentified, however, identifying the proper program is more difficult because of the variables that must be considered. Mistakes can be made in idenfication of an appropriate program for a child who is blind. An "improved" definition will not change the possibility of mistakes in identification and placement of PCD children.

Chapter One would be much more appropriate if it had presented some of the positive aspects of learning disabilities either in the form of research or editiorial comments by experts in the field.

Chapter 2

I find it hard to believe that a great deal of Chapter Two, which is supposed to describe the methodology of the study, was devoted to editorial comment. This is totally inappropriate.

Staffing reports provide only a minimum amount of information concerning the staffing. They are not intended to be minutes of the staffing. Even with *2 the inclusion of reports from various specialists, files on students staffed into LD programs provide a minimal description of what occurred in the staffing. I doubt that professionals who work in the field of learning disabilities day-in and day-out would attempt to take files on a given child and attempt to second guess the staffing committee. Are Drs. Shepard and Smith superior in knowledge and expertise to numerous staffing committees in twenty-two special education administrative units?

Chapter 4

Any attempt at explaining the prevalence of a given handicapping condition is a momumental task in inself. A study of prevalance and its suspected causes requires far more time and effort than afforded by this study. Any attempt to treat it fairly in a study such as this is ludicrous.

It is obvious that there is wide variation from state to state for all handicapping conditions. That can be verified in Table 4.2, "Percentage of school aged children served by handicapping condition under PL. 94-142 school year 1979-80". Wide variability would also be found in comparing different handicaps in all of Colorado special education administrative units.

Chapter 5

What are grades such as A, B, C, D, F, supposed to tell us about a test? What criteria were used to establish the grades? The use of grades is cute but meaningless without some basis on which to establish the grade. Assuming that the grades had been assigned based on identifiable criteria the use of two grades for some tests and one for others is inconsistent. *3

In the summary evaluation of tests the statement is made that "In the case of IQ and achievement tests, there are better tests available...". If there are better IQ tests available why is the WISC-R, for example, given a high grade?

Chapter 6

There is not one positive word about staffings in this chapter. Why? Staffings regardless of your perception, are usually positive situations and a learning experience for teachers and parents.

Chapter 7

You build a strong case for "triangulation"; the use of two or more methods to solve problems. You indicate that this method builds a stronger case. You point out that agreement on a point improves your case. You also indicate that "discrepant findings produced by multiple methods are not necessarily to be decried, for they lead us to better insight into the phenomenon studied and the methods used to study it".

This is the basis on which you set yourself up as able to make better decisions than a staffing committee without even seeing or knowing the child or the situation.

If triangulation is appropriate for you to evaluate staffings, then it should be appropriate for staffing committees. In fact, triangulation would seem to be the basis for having staffing committees. Yet you appear to be strongly opposed to the staffing process.

Chapter 8

How can you write case histories from student files? Files which you seem to feel are incomplete. Your conclusions in some of the case studies are totally incorrect. In the case study on Kristen, for example, you indicate that "neither the social worker nor the nurse found evidence of a learning disability. It is not the function of the nurse or social worker to idendify learning disabilities. Their function is to present information which will help the staffing committee reach a decision. Do you really understand the staffing process?

Chapter 9

It is unfortunate that you feel that staffing and assessment are a waste of time and money. If it were possible all children should have benefit of this process not just the handicapped.

Your understanding of the staffing process must be very limited. Staffings are usually held at a time when they will not interfer with instruction, either during the lunch hour or after school. In addition, children are not often pulled out of key instructional periods for evaluation. These factors must be considered when you try and determine the costs of staffings and evaluation.

Summary:

Obviously, Dr. Shepard is attempting to steer the State of Colorado toward a discrepancy based model for idenfifying Learning Disabled children. A move such as this requires a great deal of study and thought. A move such as this should not be made without obtaining information from states operating under such a model. Wisconsin, for example, uses a discrepancy model. In Wisconsin, IQ and achievement testing are done and a formula is applied. If a child with a normal IQ falls below a given cut off he is eligible for placement in a Learning Disabilities program; if he is above the cut off he is not eligible. Interestingly, there are Mentally Retarded, Emotionally Disturbed and Slow Learning children in Learning Disabilities programs in Wisconsin, and would you believe that staffings take anywhere from fifteen minutes to two hours, just like Colorado? Wisconsin is considering dropping the model. *4

Notes in response to Director #2.

*1. We believe and state that the federal and Colorado definitions are exemplary state-of-the-art definitions. They are not operational definitions. Moreover, it is widely acknowledged that not enough is known to establish a foolproof, "by-the-numbers" set of criteria.

*2. The Rules for the Administration of the Handicapped Childrens Act require that the staffing committee "keep accurate records of minutes of the meetings." Therefore, we should have been able to find minutes of the staffing in the files and did in 50% of the cases. Throughout the report, however, we distinguish between missing data and data that were present but which did not support a diagnosis of PCD.

*3. The grades reflect an overall assessment of merit according to the criteria of reliability, validity, and technical adequacy of norms. It is correct that if a test is unreliable, it is unreliable for all purposes (although test standards allow lower reliabilities for group decisions than for individual placement decisions.) However, representative normative data which are essential for determining a discrepancy or a severe deficit are not needed for criterion-referenced interpretations in an instructional context. Furthermore, the Standards for Educational and Psychological Tests (APA, 1974) specify that validity is not an inherent property of a test, rather "statements about validity should refer to the validity of particular interpretations or of particular types of decisions. (An Essential Standard) (It is incorrect to use the unqualified phrase 'the validity of the test.' No test is valid for all purposes or in all situations or for all groups of individuals)" (p. 31). Therefore, different evaluations are made for different purposes.

*4. Simplistic formulas will not solve the problems identified in this report. Clinicians ought to have a better understanding of what constitutes a reliable discrepancy. However, a "by-the-numbers" formula is not being advocated.

References: Standards for Educational and Psychological Tests. Washington, D.C.: American Psychological Association, 1974.

February 9, 1981

Dr. Lorrie Sheppard
PCD Identification Study
Laboratory of Educational Research
Campus Box 249
University of Colorado
Boulder, Colorado 80309

Dear Dr. Sheppard:

I would like to submit the following concerns about the PCD study - Preliminary Report.

1. We do not keep records of achievement test data in our BOCES central file. Hopefully your figures that reflect the number of students with no achievement data do not include our students simply because the test reports were not seen. Footnote added p. 61

2. Chapter five would lead most people to conclude that the only reason for testing students is to determine a handicap. I feel it is important to reflect that another purpose is to determine the needs of the student both in regular education and special education should a handicap be determined. Informal testing can be valuable when done by an experienced professional. It has not been our experience to find more testing being done than we could reasonably derive benefit. *1

3. If your interpretation of item 6 on table 3.3 concerning linguistic differences is based on question 9 of Form A., PCD Teacher Survey then I would disagree with the conclusion you reached.
   The question asked would you exclude a student who is linguistically different. You cannot exclude that student anymore than you can include him for being linguistically different. Any student experiencing undue problems has the right to have the problem looked into. You must determine the root of the problem as closely as present tools allow. Also some way should be determined to show which question on the tables in chapter 3 are reflecting survey data. *2

4. On table 7.6 if a student was tested in all areas listed but only reflected a deficit in one area, were his other scores included in the ratio for other areas. If this is the case the information presented is meaningless and having a negative connotation should not be included in the study. *3

5. When you discuss how far a student is below grade level you must consider his age as well as his grade placement. Many students who have learning disabilities end up being retained either as part of their treatment or because they have not identified as learning disabled. To ignore the fact that a student is one or more years older than his classmates and conclude that because he is only .5 to 1.0 years behind them and therefore does not have a learning deficit, cannot be supported. *4

6. Many students are screened because their teacher notes a weakness in the academic progress of the child. Other problems are noted through the results of group achievement test. The purpose of giving a more individualized test is to confirm that a problem exists and to find if a student still performs poorly when someone is able to keep him on task and make sure he understands the task expected. If his performance is still poor you may be able to establish a learning deficit. To give a second individual achievement test to verify the first would be a case of overtesting.

The conclusions in chapter 7 seem to be an accurate reflection of the state of services for the learning disabled. I feel you could have established a larger percentage of students in the achievement deficit category had age data comparisons as well as grade level comparisons been used. The difficulty I find is that unless someone reads the entire study it will not give the total picture. Most of the chapters are written in a very negative framework and are very easy to use out of context. One possible solution would be to put the chapter 7 first so that a person reading the report would get the global outlook before looking at various problems within the study. If you would like to discuss any of these concerns, please feel free to telephone.

Sincerely,

Notes in response to Director #3

*1. We agree that testing which serves two purposes "costs half as much." However, overall the majority of tests used (e.g., the WRAT) are not adequate for instructional planning. The assessments which were also used to plan interventions were generally those done by the PCD teacher and then only about one-third of the time. Three-quarters of the PCD teachers in Colorado reported that they do additional testing to direct instruction.

*2. Agreed, but shouldn't this line of reasoning have lead to a "neutral" response?

*3. This point is well taken; however, the combined math or reading discrepancy allows for significance to be counted if it occurs on either.

*4. It is problematic either way to agree on the proper normative comparison for children retained. Age comparisons are inappropriate because children have only been exposed to the curriculum of their grade peers not their age peers. Eighteen percent of the PCD pupils have been retained a year or more in school.

February 10, 1981

Dr. Lorrie Shepard
Laboratory of Educational Research
Campus Box 249
University of Colorado
Boulder, Colorado 80309

Dear Lorrie:

I apologize for the tardiness of my reply to the P/CD Study. I must compliment you and your staff for the breadth and quality of your study. Unfortunately, I haven't had time to give the study the amount of attention it deserves.

I have, however, read enough of the study to know that you have identified critical concerns in the area of P/CD: mainly improper assessment and the resulting misplacement of some of our schools' children. I believe there are implications for policy change in your findings. I also believe that changes in approach and philosophy are needed in this area of special education. I am not, however, prepared at this time to list policy implications. This, I believe, should be generated by groups of educators (be they Directors, CDE consultants, Psychologists, or combinations of such) who can reach some kind of consensus regarding your study.

I believe your study has a lot of value and should have positive impact on the area of P/CD in special education. When your study is completed, I intend to share your research with our special education staff with the hope we can do a more quality job in this area.

Sincerely,

SUBJECT: PCD Identification Study

First of all, it is very disappointing to discover that the report is incomplete. The final chapter with recommendations and implications has not been included. You explained that the review is to examine the accuracy of the finds, the methodology, our experience and our opinions on the policy implications. So, one feels diappointed that the document is not in the final draft which will be submitted to the J.B.C. Apparently there will be no opportunity to react to that final study.

The report, for the most part, is well written and researched conscientiously, with assiduously developed methodology and execution. I questioned whether you did use data to generate hypotheses rather than to confirm extant hypotheses since it is well known that you already have written a paper on test validity and leaned heavily on the works of Ysseldyke and others.

Addressing some minor points, (a) it would have been very helpful if the pages had been numbered or contained in some way. There is the ever present fear of getting them out of order and thereby losing the substance of the narrative. (b) There are some typographical errors and some mechanical errors which are distracting and should be cleaned up. (c) Dr. Mary Lee Smith's chapter is particularly well written and clear as to her intent. (d) I felt that some judgmental opinions (not substantiated with evidence) crept into the text which contaminated its pure design. For example, "Although some pupils are given too many tests, one quarter of the population have too few tests." Who is to say? How many is too many? (e) PCD teachers were queried about their types of interventions. Why? This was not a purpose of the investigation. Appendix B was missing from the draft.

The critical questions remain unanswered.

1. The hypotheses which are generated will lead to what?
2. What are the ramifications of this study?
3. What recommendations will be made to the General Assembly as a result of this study?
4. If there is over identification of PCD in Colorado, how will this impact on funding and on programs?
5. If most tests are inadequate and faith in clinical judgment may be misplaced, what alternatives are there?
6. This should impact drastically on university training programs.
7. General education may receive a setback if these "inappropriately identified" students remain in general education or return to education and teachers are forced to work with them. They will not have the resources, the training, or the motivation to meet their individual needs.

This report has some dangerous implications in terms of action that can be taken by the Colorado Legislature concerning funding for handicapped children. It appears irresponsible to offer no alternatives to the present system after opening up the issues. It is further frustrating that there is no mechanism for rebuttal before its presentation to the Education Committee.

Date: February 17, 1981

RE: Evaluation of the Identification of Perceptual-Communicative Disorders in Colorado, response to FINAL REPORT

* *

I fear the results of this research project may carry far more serious implications than at any time suspected by myself. My surface response to this study is professional embarassment, yet underneath, I believe there are some rational approaches that may be used in interpreting these findings, regarding policy formation.

First, the accuracy of findings and adequacy of methodalogy appear quite sophisticated and valid with (only) an initiative concern by myself around the breadth of the study. I feel it should be remembered that when concretizing childrens' lives, the hard data represents primarily only that particular factor measured and not necessarily the Gestalt of that child's life as dealt with over a 12 or 15 year period of time. The "State of the Art" regarding public education has never been exactly powerful, precise, and/or accurate. Specifically to the area of special education that this study relates to, I would be interested to see a similar amount of supporting data in any other area of education as well as any other public program such as from the Department of Institutions, Social Services, Mental Health, Public Health, and so forth. Alone, in the fact that information exists in the quantity that it does say something about the program.

I must admit that I do take exception with the Poor Assessment and Miscellaneous categories of the Quantitive Identification. Then looking at the consistency rating, (Poor) 68%, I believe there are significant implications. The portion of this study relating to test and assessment analysis, the final grade placement on each of the major tests, and the findings relating to clinicians lack of awareness regarding technical adequacy of assessment instruments, all point fingers at the training institutions, CDE, and the local administrative units. Why are clinicians given tools with no understandings to accompany them? Why does such a diversity exist between institutions of higher learning (i.e.: EH training programs) and why are there professors who can't remember the last time they dealt with a child, or if they do, it was prior to P.L. 94-142 if not H.B. 1164? Consistency insistency should be the standard expectation from CDE as well as the local Director of Special Education. This particular section of findings present a case for much stricter guidelines regarding the area of PCD as administered and lead by the Colorado Department of Education.

Yet, back to the defense of P/C programs as they currently exist, speaking rurally, as I'm sure as has been stated many a time before, the resource room in the name of PCD has been and is frequently the only resource in a school building for assistance to the child with notable learning problems. Thusly, we find the potpourri described in this study. If appropriations in support of PCD programs were significantly cut back, you could parallel the cut in total special educations services. I believe this to be fact as opposed to pure conjecture.

The last major area I would like to respond to is the 7.5% and 11.4% inclusion of emotionally disturbed and slow learners respectively. Particularly regarding EBD, one might ask which came first. If an elementary/secondary stratification had taken place in the analysis of data, I personnally believe the occurrance of EBD handicaps would have began increasing between the 4th to 6th grade level. By this time, the pure learning disability has picked up many emotional overtones and factors which thusly require the emotional/behavioral component to be dealt with along side of the learning/processing deficit. The slow learner relates back to the concept that the PCD program is the main resource for educational problems in a school building. This does not justify the inclusion of slow learners, only states my response perspective to the issue.

In conclusion, it is my request that the legislature approach, the policy formation in response to this major research study in a sensitive manner and that a realization be kept in mind that we are talking about the lives of children and not just statistical analysis and results.

Respectfully,

February 17, 1981

Dr. Lorrie Shepard
Laboratory of Educational Research
University of Colorado
Boulder, CO 80302

Dear Dr. Shephard,

I was totally shocked by the conclusions drawn by your study. I can not believe that you can make judgements about children without even knowing the children. A committee composed of people who know the student surely can make better judgements about the student than you can by just examining paper work. We might be guilty of not doing sufficient paper work but I totally disagree that we have mislabled students as badly as you state.

I would have felt that you would have stated in the study that it is hard to know the child and the handicap without seeing the child and talking to people who know the child.

I hope that the people who read the study realize that the study really has not basis for making the statements that are made.

Sincerely,

TO: Dr. Lorrie Shepard

DATE: February 20, 1981

SUBJECT: Evaluative Issues of the PCD Identification Study

It is the understanding of this administrative unit that research in education is a search for knowledge. It is not a search that yields infallible truth, but rather a search that will put new light on questions that concern us as educators.

With respect to this attitude, it is our opinion that some very positive results have come about from this study. The researchers have done a very thorough and commendable job in testing the existing theories for identifying PCD students; and from this, stimulated several ideas of how special educators might develop new theories which would be better defined and more conclusive in assisting with the identification of the PCD population.

As a result of this study, we look forward to our state taking a more active role in outlining specific and objective guidelines, definitions, and adequate assessment measures with regards to the identification of the PCD student.

We express our appreciation for this significant initial effort.